THE IRON TRADE REVIEW

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Market's Position Is Conflicting

Continued Strength in Lighter Lines Parallels Growing Weakness in Heavy Products—Lower Prices on Plates, Shapes and Bars—Implement Manufacturers Suspend 25,000 Tons—September Pig Iron Output at Higher Rate

MARKET conditions in iron and steel are contradictory in their evidence of both weakness and strength which varies with the character of the material and the producer. Some lines show great firmness; others have been softening further under a situation where order books are shrinking and buyers are refusing persistently to be attracted. Some further narrowing of the wide gap that has separated the price schedules of the Steel corporation and the independent mills apparently has made consumers more determined than ever to play a waiting hand. This is especially true since much of the pressure for prompt delivery of material has gone out of the market and more and more new requirements are being determined on the basis of competitive steel costs. The fundamental soundness of iron and steel conditions emphasized by leading producers has created a more cheerful feeling in those quarters where any advance in prices by the leading interest would be regarded as an important factor toward the restoration of confidence.

Heavy Lines Weaker

The market's weakest side still is to be found in plates, shapes and semi-finished material. A tonnage of tank plates was closed at New York at 3.00c, Pittsburgh, and this figure has been named on Chicago business. Shapes have dipped below 3.00c on quotations of 2.90c at New York and 2.85c at Chicago, the latter in connection with the 8750-ton federal reserve bank building which is exciting keen competition. Bars also are understood to have been offered at 3.00c, Pittsburgh, in the Chicago market. The bar situation does not present so strong a front and demand is less insistent though the mills still are well booked, especially on the smaller sizes. An important factor in this easing up of bars is the slowing down of the demand from the agricultural implement manufacturers, some of whom now are on a 60 per cent basis of operations. Suspensions and cancellations by these interests in the Middle West last week with the largest producer cover 25,000 tons.

On a 6000-ton lot of sheet bars to a Mahoning valley consumer, the business went to a northern Ohio sheet producer ordinarily not a seller, at $60, mill. Some makers farther distant quoted under $60, mill. Despite the sharp competition for this business, a Mahoning valley steelmaker reports additional sales of 14,000 tons of sheet bars at $70 and even $75, mill, though it is believed some special considerations applied. Rerolling billets are selling down to $55, Pittsburgh. Forging billets are freely obtainable at $70.

Strength is most apparent in wire products, pipe, small bars and tin plate, where all the mills practically have as much tonnage as they care to handle. The American Steel & Wire Co. is quoting an $8 per ton advance on cold-rolled shafting.

Iron Output Is Higher

Pig iron production in September was at the average daily rate of 104,166 tons compared with 101,469 tons in August. Merchant furnaces produced iron on a lower scale in September than in August but steelmakers' stacks scored some gain. For the 30-day month the total output was 3,124,994 tons compared with 3,145,536 tons in the 31 days in August. Active furnaces increased to 317 on Sept. 30, a gain of 11.

Intimations of a possible advance in the Steel corporation rail prices for next year are not surprising. The present $47 figure of the leading producer compares with $60 which some independents have had in mind. At Chicago tentative rail bookings for next year now are placed in excess of 500,000 tons. Car orders for the year to date total about 65,000, a rather mediocre showing.

Iron Prices Unsettled

Unsettlement marks the pig iron situation and exact prices are impossible of determination at the moment because sales are so few and small. This especially applies to basic of which several steelmakers are receptive sellers at $3 to $4 under the last prices of the merchant furnaces but have had no opportunity to market any tonnage. Mahoning valley makers have quoted or indicate they will quote $45, furnace. A sale of 1000 tons of October basic to a Warren, O., steelmaker at $46, valley, made by a middleman has attracted attention as an indication of what producers probably would be obliged to name to attract buyers.

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Machinery Prospects and Guesswork

GUESSWORK has been indulged in freely during the last several weeks by buyers and sellers of machine tools in an effort to fasten upon "something" as a reason for the lull in which the industry finds itself enveloped. Some sellers have stated that the apparent listlessness on the part of machinery users can be expected to continue until after election. Others contend machine tools will be bought and sold, election or no election, and regardless of the political complexion of the next administration. Another group of dealers believes that the present period is one of reaction after the long drawn-out period of feverish buying and selling, started during the war. Various other theories have been advanced.

Those who have made a close study of the situation assert any dullness apparent in the machinery and equipment market at this time cannot and should not be attributed to any one cause but to a combination of circumstances, most of them contingent upon the movement inaugurated some time ago to deflate credits and thaw "frozen" credits. As one prominent middle western machine tool dealer tersely remarked recently:

"One major operation does not render immunity from further ills; if a boy cuts his finger and it heals, he does not congratulate himself that nothing else will hurt him. Just so with the machine tool industry; after the election if business does not improve no doubt there will be plenty of new guesses advanced as to why machinery orders are not forthcoming and these just as likely as not will be wide of the true mark. At best this will be mere guesswork and guesswork cannot cure a sick machinery market."

Such a view undoubtedly will commend itself to all who have followed the vagaries of trade and markets and have seen the futility of trying to fix upon any one cause for a lapse of business. It would seem that the machine tool industry merely is sharing with other lines of production the general unsettlement of enterprise and that it scarcely may expect to revive until the industrial situation becomes more clarified or until the country works itself out of a gradual credit deflation. This process may require two months, four months or a longer period, no one can tell.

Many dealers and manufacturers state they will be content if during the next few months they will be able to show their overhead and something besides and all feel that if they can do this, they will be in a strong position to meet the large volume of business which they believe is bound to come. Conservative and cheerful business methods coupled with contentment with a measure of sales considerably lower than wartime volume will do more to weather the present period of uncertainty, be it of long or short duration, than all the guesswork in the world regarding the reason for the prevailing slump of business or when the depression will terminate.

European Market Affects Zinc

JUDGING from authoritative statistics, the zinc industry is suffering acute depression. On Sept. 1 only about 78,500 retorts were active, or about 50 per cent of standing capacity; Dec. 21, 1917, 216,046 retorts were standing, so that capacity operating Sept. 1, 1920, represented only about 35 per cent of the capacity available at the height of war activity. Prime western zinc prices now are below the average cost of production at operating smelters. Metal has sold down to 7.50c, East St. Louis, by Oct. 1, which is said to be below present ore and smelting costs.

The weakness of the zinc market has been due largely to the influence of European markets. British prices broke some months ago and from a customer for American zinc England has subsequently been a source of supply. During the first six months of 1920 American exports of zinc averaged nearly 15,000 tons monthly and the average in 1919 was about 12,000 tons monthly. By September, exports has dwindled almost to the vanishing point, custom house returns for New York, the principal exporting port, showing only 440 tons going out. On the other hand, prices had fallen so low in London that it has become profitable to ship back to this country large tonnages of American zinc. The return movement already has started, more than 2400 tons arriving in September.

670.5 I7 v.67 pt.2

During the past month, sales of zinc, for shipment from abroad or already arrived, accounted for the bulk of the activity and domestic producers have had to lower their prices at St. Louis to keep them in line with the market for foreign zinc at New York. Meanwhile, indications are that output will be still further curtailed to complete the readjustment of the American market to its loss of its export outlet. German offerings have established the low prices in London and Belgium is gradually increasing its output, having produced 7400 tons in August, or nearly 50 per cent of its prewar average.

Apparent American consumption of zinc the first six months of 1920 is given at about 175,000 tons, or at the rate of 350,000 tons annually. Production of smelters in August probably will amount to about 30,000 tons, or at the rate of 360,000 tons annually. In other words, provided there is no return of export business, the current smelter production of slab zinc will just about meet domestic needs, based on the requirements of the first half of 1920. In view of the coal, steel and Waterbury brass mill strikes of that period, it is probable domestic consumption will show no falling off the last half the year.

Has the Public Strike Rights?

DOES the public sustain any monetary loss as result of the average strike? The bureau of statistics of the department of labor at Washington says not. In a statement put before the country in which it obviously attempts to draw various conclusions from the excessive number of wage disputes of the past few years, the board declares the public does suffer "inconvenience" from strikes but that rarely is it put out of the pocket.

It is difficult to conceive of a more misleading or fallacious utterance to the country at large from any body to which it has been given the authority to speak in the name of the government. The average man knows the reverse to be true and he knows it because of his own personal experience. Can the labor board possess the bland stupidity to declare that a street car strike, a coal strike, a clothing trades' strike, or whatnot of a dispute involving a cessation of production does not cost the public something? It knows as well as every one else that the public in the end pays the bill in varying amounts and directness as the particular interruption crosses its daily life.

The statement of the bureau of statistics smacks of a subtle propaganda in the interest of the encroachments of the labor unions for which the various subbodies of the department of labor have stood as an apologist at various times when the occasions required. The doctrine it attempts to advance is contrary to the trend of all progressive thought which recognizes more and more the rights of the public as a third party in all labor troubles. It is significant that the declaration of the bureau of statistics comes along at a time when the unions are bitterly fighting the spread of the Kansas industrial court plan in which public interests are safeguarded where strikes occur. Nebraska has just adopted this plan against the strongest opposition that organized labor could muster. Mr. Gompers says that no right of the public is paramount to that of labor itself. This of course is idle prattle when it comes to convincing those who often are more seriously concerned because of suffering or loss than either capital or labor, namely the public.

Premium Market Fades

RECENT sharp reductions in the price of semifinished have stood out rather conspicuously in the present iron and steel market situation of mixed strength and weakness. Yet it needs only a glance at the prevailing quotations on finished material to supply the reason. Semifinished steel has been decidedly out of line with the market on finished material for some months except where an extraordinary condition has existed that has called for the payment of large premiums because of an excessive demand. Such a situation in highly finished sheets for the automobile industry was responsible for the $90 or more paid for sheet bars some weeks ago. The high level of tin plate also has lent support to the sheet bar market. With the collapse of the automobile sheet market, sheet bars are back to $60 and $65, which is more in harmony with the price of sheets to the ordinary trade.

The billet market has reflected a condition somewhat analogous to that in sheet bars. Large billets until recently were selling around $65 per gross ton and small billets $5 higher. Strip steel for which large premiums have been paid has been an important factor in the high billet prices. At the same time steel bars have been commanding, disregarding the Steel corporation price, from $65 to $80 per net ton. The latter price has applied to limited tonnage and has been occasioned by the difficulty of obtaining early bars, especially in the smaller sizes. Slabs in the open market were sold at $65 per gross ton at the same time plates were bringing not over $70 per net ton and undoubtedly lower in some cases. Slabs and billets now have dropped in price as demand for prompt material has subsided. Wire rods are the firmest of all semifinished lines and are holding up around $75.

The market in semifinished steel in recent months clearly has been registering the premium condition of prices that has existed in some finished lines. With better mill shipments and increased production as effects of the railroad blockade have been wearing off, material has been more plentiful and actual or feared shortages have ben relieved. The result has been a rather abrupt disappearance of premiums in all lines. Semifinished prices have been quick to reflect this fact.

Iron and Steel Prices

CORRECTED TO WEDNESDAY NOON—SCRAP, WAREHOUSE, ORE AND OTHER PRICES ON PAGES 1028 AND 1032

Pig Iron

Bessemer, valley	*$48.50
Bessemer, Pittsburgh	*50.46
Basic, valley	*48.50
Basic, Buffalo	50.00
Basic, Pittsburgh	*50.46
Basic, delivered, eastern Pa.	51.00 to 51.50
Malleable, valley	50.50
Malleable, Pittsburgh	52.46
Malleable, Chicago, furnace	46.50
Malleable, Buffalo, furnace	51.25
Malleable, delivered, eastern Pa.	52.00 to 55.00

*Nominal.

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eastern and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. IX, eastern delivered Phila.	53.00 to 57.60
No. 1X, Buffalo	53.00
No. 1 foundry, Chicago furnace	48.25
No. 2 foundry, valley	47.00
No. 2 foundry, Pittsburgh	48.96
No. 2 foundry, Buffalo	50.00
No. 2 foundry Chicago furnace	46.00
No. 2 foundry, Ironton furnace	45.00 to 47.00
No. 2 foundry, Cleveland furnace	47.00 to 48.00
No. 2X, eastern delivered Phila.	50.25 to 53.75
No. 2X, eastern N. J., tidewater	50.50 to 53.75
No. 2X, eastern del. Boston	56.06 to 58.06
No. 2X, foundry, Buffalo furnace	51.25
No. 2 X, Buffalo del. Boston	55.71 to 56.71
No. 2 foundry del. Philadelphia	49.25 to 52.25
No. 2 foundry N. J., tidewater	49.50 to 52.50
No. 2 southern, Birmingham	42.00
No. 2 southern, Cincinnati	46.50 to 49.50
No. 2 southern, Chicago	48.66
No. 2 southern, Phila.	50.66
No. 2 southern, Cleveland	48.66
No. 2 southern, Boston	52.67
No. 2 southern, St. Louis	47.74
No. 2X, Virginia furnace	49.25 to 51.25
No. 2X, Virginia, Philadelphia	54.99 to 56.99
No. 2X, Virginia, Jersey City	55.41 to 57.41
No. 2 X, Virginia, Boston	55.51 to 57.51
Gray forge, valley, Pittsburgh	50.96
Gray forge, eastern Pa.	48.00 to 50.10
Low phosphorus, standard, valley	58.00
Low phosphorus, standard, Phila.	65.32
Low phosphorus, Lebanon furnace	57.00
Charcoal, Superior, base, Chicago	58.50

Silvery Iron

8 per cent base at furnace

Jackson County, Ohio	$60.00
Tennessee, Chicago delivery	62.53
Ohio brands, Chicago	65.07

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 per cent	$69.50
11 per cent	72.80
12 per cent	76.10

Coke

Connellsville furnace	$16.50 to 17.00
Connellsville foundry	18.00 to 18.50
Pocahontas furnace	18.00 to 19.00
Pocahontas foundry	19.50 to 20.00
New River furnace	18.00 to 19.00
New River foundry	19.00 to 19.50
Wise county furnace	18.00 to 19.00
Wise county foundry	19.00 to 19.50

Ferroalloys

Ferromanganese, 80 per cent, c.i.f. Atlantic ports, domestic metal	170.00
Ferromanganese, 80 per cent, English, c.i.f. Atlantic ports	160.00 to 170.00
Spiegel, 18 to 22 per cent furnace spot	80.00
Ferrosilicon, 50 per cent, spot and contract, delivered	82.50 to 85.00
Ferrotungsten, standard, per pound contained, furnace	1.10 to 1.15
Ferrochrome, 60 to 70 per cent chromium, 6 to 8 per cent carbon, per pound contained, maker's plant	0.18 to 0.19
Ferrovanadium, 30 to 40 per cent per pound contained, according to analysis	6.50 to 9.00
Ferro carbon-titanium, carloads, producers plant, per net ton	200.00

Semifinished Material

BILLETS AND BLOOMS
(4 x 4 inch)

Open-hearth, Pittsburgh	$55.00 to 60.00
Open-hearth, Youngstown	55.00 to 60.00
Open-hearth, Philadelphia	60.74 to 65.74
Bessemer, Pittsburgh	55.00 to 60.00
Bessemer, Youngstown	55.00 to 60.00
Forging, Pittsburgh	70.00
Forging, Philadelphia	70.74 to 80.74

SHEET BARS

Open-hearth, Pittsburgh	$60.00 to 65.00
Open-hearth, Youngstown	60.00 to 65.00
Bessemer, Pittsburgh	60.00 to 65.00
Bessemer, Youngstown	60.00 to 65.00

SLABS

Pittsburgh and Youngstown	55.00 to 60.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$75.00
Grooved skelp, Pittsburgh	3.25c
Sheared skelp, Pittsburgh	3.25c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.45c to 3.10c
Structural shapes, Philadelphia	2.80c to 3.45c
Structural shapes, New York	2.83c to 3.48c
Structural shapes, Chicago	2.83c to 3.53c
Tank plates, Pittsburgh	2.65c to 3.50c
Tank plates, Chicago	3.03c to 3.88c
Tank plates, Philadelphia	3.00c to 3.85c
Tank plates, New York	3.03c to 3.88c
Bars, soft steel, Pittsburgh	2.35c to 3.50c
Bars, soft steel, Chicago	2.73c to 4.13c
Bars, soft steel, New York	2.73c to 4.38c
Bars, soft steel, Philadelphia	2.70c to 4.35c
Bar iron, common, Phila	4.85c to 5.35c
Bar iron, common, Chicago	3.75c to 4.50c
Bar iron, common, Cleveland	4.50c to 5.00c
Bar iron, common, New York	4.88c
Bar iron, common, Pittsburgh	4.75c to 5.00c
Hard steel bars, Chicago	3.75c to 4.00c

Rails, Track Material

Standard bessemer rails, mill	$45.00 to 60.00
Standard open-hearth rails, mill	47.00 to 62.00
Relaying rails, light, St. Louis	52.00 to 55.00
Relaying rails, Pittsburgh	50.00 to 55.00
Angle bars, Pittsburgh base	3.00c to 4.00c
Angle bars, Chicago base	2.75c
Light rails, 25 to 45, mill	2.75c to 3.75c
Spikes, railroad, Pittsburgh	4.00c to 4.25c
Track bolts, Pittsburgh	6.00c to 6.50c
Track bolts, Chicago	4.98c to 6.38c
Track spikes, Chicago	4.63c
Tie plates, Chicago	3.00c to 3.50c

Wire Products

(100 lbs. to jobbers, carloads; retailers, 5c more)

Wire nails, Pittsburgh	$3.25 to 4.50
Plain wire, Pittsburgh	3.25 to 4.00
Galvanized wire, Pittsburgh	3.95 to 4.70
Barbed wire, painted, Pittsburgh	3.65 to 4.15
Barbed wire, galvanized, Pittsburgh	4.35 to 5.10
Polished staples, Pittsburgh	3.65 to 4.15
Galvanized staples, Pittsburgh	4.35 to 5.10
Coated nails per count keg, Pitts.	2.85 to 4.10

Chain, Piling, Strip Steel

Chain, 1 in. proof coil, Pitts. 7.25c

Sheet piling, base, Pittsburgh 3.25c to 4.00c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 6.25c to 8.50c.

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	4.35c to 7.25c
No. 28, bessemer, Pitts.	4.35c to 7.25c
No. 28, open-hearth, Chi.	4.73c to 7.88c
No. 28 Philadelphia	4.70c to 7.35c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	4.35c to 8.50c
No. 28, bessemer, Pitts.	4.35c to 8.50c

GALVANIZED

No. 28, open-hearth, Pitts.	5.70c to 8.50c
No. 28, bessemer, Pitts.	5.70c to 8.50c
No. 28, open-hearth, Chi.	6.08c to 9.38c
No. 28, open-hearth, Philadelphia	6.05c to 8.85c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.55c to 5.50c
No. 10, bessemer, Pitts	3.55c to 5.50c
No. 10, open-hearth, Chi.	3.93c to 6.38c
No. 10, open-hearth, Phila.	3.90c to 5.85c

Full sheet schedule page 1032.

Tin Plate

(Per 100 lb. box)

Tin plate, coke base, Pitts. $7.00 to $8.50

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers	Carloads Black	Carloads Galv.
¼ to 3 in., butt steel	54 to 57½	40½ to 44
¼ to 1½ in., butt, iron	24½ to 34½	8½ to 18½

Full pipe schedule page 1032.

Boiler Tubes

Steel, 3½ to 4½ inches, c. l. 20 to 40½

Iron, 3½ to 4½ inches, c. l. list to 11 off

Cast Iron Water Pipe

Without War Freight Tax

(Class B Pipe)

Class A pipe is $2 higher than Class B

Four-inch, Chicago	88.10
Six-inch and over, Chicago	83.10
Four-inch, New York	87.22
Six-inch and over, New York	77.22
Four-inch, Birmingham	79.00 to 83.00
Six-inch and over, Birmingham	74.00 to 78.00

Hoops, Bands, Shafting

Hoops, Pittsburgh	3.05c to 5.50c
Bands, Pittsburgh	3.05c to 5.50c
Hot rolled strip steel, Pitts. stamping quality	5.50c

Cotton ties, 3000 bundles and over $2.06 to $2.51 per bundle mill, October basis, with 1½c per bundle per month carrying charge.

Rivets

Structural rivets, Pittsburgh	4.75c
Boiler rivets, Pittsburgh	4.85c
Rivets ⅞ in. and smaller, Pitts.	40 to 40-10 off

Nuts and Bolts

(Prices f.o.b. Pittsburgh)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	20-10 off
Cut thread	20 off
Larger and longer	20 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	25-10 off
Cut thread	25 off
Larger and longer	25 off
Plow bolts Nos. 1, 2 and 3 heads	25 off
Other style heads	20% higher
Stove bolts in packages	60-10 off
Stove bolts in bulk	2½ off
Cold pressed semifinished hexagon nuts ⅝ in. and larger	40 off
Cold pressed semifinished hexagon nuts ⅝ in. and smaller	40 off
Gimlet and cone point lag screws	40 off

NUTS

(Up to 1¼ and 1½ inches inclusive)

Hot pressed, square blank	50 off
Hot pressed, square tapped	list
Hot pressed, hexagon blank	50 off
Hot pressed, hexagon tapped	list
Cold pressed, square tapped	list + $1.00
Cold pressed, square blank	list + $1.00
Cold pressed, hexagon tapped	list + $1.00
Cold pressed, hexagon blank	list + $1.00

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Prices Present and Past

Representative market figures yesterday, one month ago, three months ago and one year ago

Prices given in this table are those ruling on the largest percentage of sales, at the dates named

	Prices Oct. 6, 1920	Average prices Sept., 1920	July, 1920	Oct., 1919
Bessemer, valley, del., Pittsburgh	$ 50.46‡	$50.46	$46.80	$29.35
Basic, valley, delivered, Pittsburgh	50.46‡	50.46	47.40	27.15
*No. 2 Foundry, val. del. Pittsburgh	48.96	40.56	46.40	28.85
*No. 2 Foundry, Chicago, furnace	46.00	46.00	44.40	27.55
Lake Superior charcoal, Chicago	58.50	58.30	57.50	33.15
Malleable, valley	50.50	50.50	44.80	29.15
Malleable, Chicago	46.50	46.50	44.90	28.00
*Southern, No. 2, Birmingham	42.00	42.00	42.30	27.45
*Southern Ohio, No. 2, Ironton	46.00	46.80	44.00	28.80
Basic eastern, del. eastern Pa.	51.25	51.65	44.25	27.90
**No. 2X, Virginia, furnace	50.25	50.25	44.75	30.35
**No. 2X, eastern del., Philadelphia	52.75	53.75	48.10	32.00
Gray forge, valley del., Pittsburgh	50.96	50.95	45.40	27.65
Ferromanganese, 80 per cent, tidewater	170.00	170.00†	200.00†	110.00†
Sheet bars, bessemer, Pittsburgh	65.00	68.50	70.00	43.20
Sheet bars, open-hearth, Pittsburgh	65.00	68.50	75.00	43.20
Billets, bessemer, Pittsburgh	60.00	60.00	65.00	39.30
Billets, open-hearth, Pittsburgh	60.00	60.00	65.00	39.30
Steel bars, Pittsburgh	3.25	3.25	3.25	2.35
Steel bars, Chicago	4.13	3.93	3.52	2.62
Iron bars, Philadelphia	4.85	4.85	4.50	2.745
Iron bars, Cleveland	$4.50	4.30	4.00	2.75
Iron bars, Chicago mill	3.75	3.75	3.75	2.70
Beams, Chicago	3.48	3.63	3.32	2.72
Beams, Pittsburgh	3.10	3.10	3.25	2.45
Beams, Philadelphia	3.45	3.57	3.50	2.695
Tank plates, Pittsburgh	3.25	3.50	3.50	2.65
Tank plates, Chicago	3.63	3.88	3.77	2.89
Tank plates, Philadelphia	3.60	3.75	3.75	2.895
Sheets, blk., No. 28, Pittsburgh	7.00	7.00	7.00	4.35
Sheets, blue anld., No. 10, Pittsburgh	5.00	5.00	5.00	3.55
Sheets, galv., No. 28, Pittsburgh	7.50	7.50	7.50	5.70
Wire nails, Pittsburgh	4.00	4.00	4.00	3.25
Connellsville furnace coke	16.50	16.90	15.20	4.15
Connellsville foundry coke	17.50	17.90	16.10	5.60
Heavy melting steel, Pittsburgh	28.00	28.60	25.70	20.00
Heavy melting steel, eastern, Pa.	24.50	26.40	22.00	19.55
Heavy melting steel, Chicago	22.00	24.20	23.70	18.80
No. 1 wrought, eastern Pennsylvania	32.50	34.40	33.50	27.00
No. 1 wrought, Chicago	24.50	27.50	28.10	22.00
Rerolling rails, Chicago	36.00	38.50	34.90	26.80

‡Nominal. *1.75 to 2.25 silicon. **2.25 to 2.75 silicon. †delivered.

Pig Iron Prices Are Uncertain

Absence of Direct Sales by Producers Leaves Market Level in Doubt—Basic Offered at $45 Valley by Steelmakers—October Basic Sold at $46 Valley by Broker—Buyers Holding Off

Philadelphia, Oct. 5.—Pig iron conditions in this district are quiet. The main transactions of the week involved 5000 tons of copper-bearing low phosphorus for export and the price is understood to have been $57, furnace. A few small domestic sales were made at this price. Copper free low phosphorus basic, bessemer and gray forge are featureless. Foundry sales are few and resale iron has been involved mostly on the basis of $48 to $50, base Virginia furnace, and $49 to $50, base eastern Pennsylvania furnace. Resale iron, however, is not so abundantly offered as a couple of weeks ago. Shipments of iron by furnaces has been interfered with by difficulty in getting coke deliveries. While the coke supply is adequate, a shortage of locomotives, particularly on the Pennsylvania railroad, is retarding deliveries and at least one eastern furnace has been banked and others are threatened as a result. Sales by eastern Pennsylvania makers the past week were few. They were restricted to this year and were on the basis of $50, furnace. Not much interest is displayed in next year's iron by consumers and recent first half foundry inquiries generally have been withdrawn. A Baltimore malleable inquiry recently put out has not been closed. Malleable is offered at resale at $48, Buffalo, to eastern consumers.

Both Play Waiting Game

Chicago, Oct. 6.—With consumers and producers of pig iron simply waiting for developments the market at present is assuming the condition of a test of strength as to which can wait longest before making a definite move. With producers sold for their entire production during the present year and possibly for some iron to be shipped after Jan. 1, no reason exists for their former pushing the market. On the other hand consumers appear to have sufficient iron in hand and on contract to cover requirements until next year. As a result, the market is devoid of inquiry except for some spot iron. Producers are shipping all the iron they make and probably not more than 1000 tons has been piled by furnaces here. Few orders to delay shipments are being received but many requests are being made by melters that shippers anticipate the contract time, indicating that more foundries are busy and need iron than have been interferred with by slack conditions. Practically no buying for 1921 delivery is being done. Foundry iron, of 1.75 to 2.25 silicon, continues to be quoted at $46, with malleable at $46.50, furnace. Sales at the latter figure have been made within the past few days in small tonnages. Southern iron is steady at $42. Birmingham, with Virginia iron quoted at $48 to $50, furnace, for 1.75 to 2.25 silicon. Revised freight rates practically prevent iron from Virginia being shipped into this territory. Resale iron continues to come out at concessions of $1 to $1.50. An inquiry for 500 tons of silvery iron for a Wisconsin melter, which has been current for several weeks, is still unsatisfied. While the quotation on this grade remains at $60, furnace, with several makers, others have shaded this figure by at least $2 and possibly $3. This figure has not tempted the inquirer in question. Low phosphorus iron is inactive, with $60, Ohio furnace quoted by makers. The ferromanganese market remains quiet, with $170, seaboard quoted. An occasional small sale is being made but the market has no life. Spiegeleisen is strong at $75 to $85 quoted but in the absence of inquiry the market is quiet. Ferrosilicon, 50 per cent, is nominal in the absence of inquiry with quotations at $82.50 to $85, furnace. Makers of electrolytic ferrosilicon are competing vigorously for the lower silicon qualities and in some cases are underquoting the furnaces.

Middleman Sells Basic at $46

Cleveland, Oct. 5.—A sale of 1000 tons of basic for October shipment to a Warren, O., consumer at $46, valley furnace, has come in for much discussion in a dull market. This lot of iron which will come from a valley steelmaker was sold to the buyer through a Cleveland middleman. For that reason its bearing upon the open market is minimized. While the basic market undoubtedly has weakened considerably, its exact level at present still is a matter for speculation, because there are no sales by the furnaces direct upon which to base a representative quotation. Nor is there any inquiry current. The Canton, O., consumer which has had out an inquiry for the past week or two for round tonnage reports that it has bought no iron whatever. It is understood that some furnaces, including steelmakers, will be willing to entertain basic business at $46 or less, but they want offers of definite business before they will make a quotation. The week has been one of the quietest that the iron market yet has witnessed in this territory. Sales amounted to only a few hundred tons. A lot of 150 tons of malleable for fourth quarter ship-

ment was sold to New England at $47.50, furnace, or approximately $53, delivered. Cancellations and suspensions still are being received from some consumers, particularly in the automotive field but these are being offset in some particulars by instructions to renew shipments where the letter had been held back. In one case an automobile builder has ordered forward 1000 tons monthly which had been suspended. A number of consumers are offering for resale some of the iron they have on hand. In certain directions consumers have asked the furnaces to ship lots of iron on order to certain destinations where they have resold this tonnage. This is rather an unusual situation and the furnaces now are considering what attitude they should take on the matter. Shipments still continue good and are fully up to production. A Cleveland furnace sold 500 tons of foundry iron for shipment this year at $47 base.

Buyers Still Waiting

Boston, Oct. 4.—Except for unusually good delivery of pig iron, the market in this district presents little activity. Dealers and consumers alike feel that the present is not the right time to buy for the first half. Fewer contracts have been placed for 1921. Eastern furnaces are maintaining prices firmly. Many are still two, three and four months behind on delivery. Despite many cancellations, foundries in general are operating at full capacity with sufficient business ahead for the remainder of the year. In the Naugatuck valley, Connecticut, several of the foundries are turning away business. Machine tool casting work has fallen off appreciably but jobbing foundries seem to be able to replace cancelled orders. Stove foundries are in their busiest season and have placed several spot orders for pig iron. A Massachusetts valve manufacturer reports an increase in municipal work, completely filling its order books for three months ahead. Furnace prices during the week have remained unchanged but resale iron has become more plentiful in the market. Sales of the latter have been reported at from $3 to $4 below current prices. A Massachusetts consumer bought 300 tons of Northern No. 2X (2.25 to 2.75 silicon) at $52.50, delivered, and other small sales were made at approximately this figure. One southern furnace is making barge shipments to Providence and other New England points, and is continually making small sales. It is the intention of this interest to establish a permanent storage at Providence for the usual silicon grades of iron.

Eastern Demand Very Limited

New York, Oct. 4.—Demand for pig iron has been of very limited proportions in this district during the past week. All of the iron sold involved prompt and nearby shipment. Some consumers are showing interest in their first quarter and first half requirements but are afraid to take definite action at this time. The furnaces all are making shipments in much better volume than for a long time past, with the result that consumers are in a better position to provide themselves with stock for the winter months. While in some cases consumers have requested that furnaces hold up shipments, there also are requests that shipments be expedited. Resale offerings do not involve as much tonnage at present as a couple of weeks ago. Prices on resale iron are unchanged, however. Resale Buffalo foundry has been sold during the past week at $48 to $50, base, Buffalo. Resale offerings of eastern Pennsylvania iron are scarce and such iron is bringing at resale around $49 to $50, base, eastern Pennsylvania furnace. Sales of eastern Pennsylvania iron also have been made by the producers at as high as $53, base, furnace, plus $1 differential. Some business also has been booked for this year by eastern Pennsylvania makers on the basis of $50, furnace.

Market Distinctly Softer

Pittsburgh, Pa., Oct. 5.—Lack of market purchases direct from furnace interests is the only thing that prevents marking down of pig iron prices several dollars. This fact is clearly established in view of the offering of furnace interests who are prepared to shade the nominal quotation to the extent indicated. Added significance is given to the softened tone of the market by reason of tonnages quoted to melters by steel work furnaces. A valley steelmaker is quoting $45, valley furnace, on basic iron or $3.50 under the current nominal quotation for early delivery and is said to have named this level in response to an inquiry for 1000 tons of this grade put out by a steel producer in this district for October shipment. This latter interest has not closed and apparently is hoping for a still lower quotation. It is believed that bessemer iron also could be bought for $45, valley furnace. There is almost a total lack of inquiry, consumers showing increased caution in view of the declining market. No activity exists in foundry iron, No. 2 (1.75 to 2.25 silicon) being quotable at $47, valley. A fair lot of resale basic and bessemer iron also is understood to be on the market and a steel foundry in this district is trying to dispose of 1000 tons of bessemer iron quoting $47, but it is believed this figure could be shaded.

Pig iron makers, while conceding that the market is softer, express the opinion that it will remain now for the next month or six weeks, partly due to the larger shipment against contracts and to curtailment in the steel output, and believe that a reaction will follow and the market become more active and firmer. This view is not shared by consumers who think they will be able to cover first half contracts at considerably less than the current quotation but as yet no business for this delivery has been done by furnace interests in this district. The increased production also has been a factor in making the pig iron market easier and this, together with the better transportation situation, has added to the volume of delivery to such an extent that some consumers are asking that shipment be held up, although in several instances immediate delivery is being requested. Despite this situation, however, stocks at furnaces have ben cleaned up to a considerable extent and at some stacks no iron at all is piled. The average price of both bessemer and basic iron for September was $48.50 valley, according to the figures of W. P. Snyder & Co. The August averages were $47.393 for bessemer and $48.373 for basic. The levels of September were the highest since August, 1917, when the average of bessemer was $53.21 an dof basic, $49.422 as compared with an average of $56.50 for bessemer and of $52.82 for basic in July, 1917, the highest prices of steelmaking iron in the history of the industry in this country. The Pittsburgh Crucible Steel Co. had hoped to start its new No. 2 600-ton blast furnace at Midland, Pa., yesterday but has been unable to do so owing to the shortage of coke.

Sales Report Disturbing

Buffalo, Oct. 5.—The market having been disturbed during the past week by the reports of sales at considerably under quotations, furnacemen are eagerly watching the situation and are in a very uncertain frame of mind. Little selling has been done. One lot of 100 tons of No. 1X foundry (silicon 2.75 and up) was sold for $53. Another furnace states it has sold approximately 1000 tons of foundry at no concessions in price. Resale iron is being sold from time to time but the prices are not available. The furnace interest selling the 3000-ton lot of malleable last week asserts this order is based on market quotations prevailing during November and December when the iron will be shipped and no specific figure other than this was named.

Easier Price Situation at St. Louis

St. Louis, Oct. 5.—No inquiries for pig iron are before the market, and consumers apparently have all the metal they require for some time. Furnaces are busy shipping against contracts and seem anxious to send forward as large tonnages as possible. Dealers report a number of requests to hold back shipments, and a growing number of consumers are desirous of cancelling orders. About the only two consuming interests showing much activity are the stove and carwheel makers. From these there have been requests to expedite delivery on contract, and several are reported to have purchased a few extra carloads. The outlook for fall and winter trade in the stove industry is excellent. The demand for car wheels apparently is much better, relatively, than for other finished and semi-finished materials used by the carriers, as general buying from that source it not on a broad scale. Furnaces which recently were quoting as high as $45 for No. 2 southern foundry iron (1.75 to 2.25 silicon) are now offering it at $42. At the latter price large tonnages are available. There were rumors early in the week of cuts in price by southern furnaces, but these could not be confirmed, representatives of the interests involved declaring they had heard nothing of the matter. While desiring to accommodate customers, the furnaces are not finding it expedient in all cases to hold back on deliveries, and there is a very strong reaction on the part of makers against cancelling orders, especially those at high prices.

Little Activity in South

Birmingham, Ala., Oct. 5.—While there is not much activity in the pig iron market in the Birmingham dis-

trict, furnace companies manifest confidence in the future. The tonnage of iron being shipped on contracts is well maintained and belief prevails that the larger proportion of the accumulated stock of iron will be removed by the end of the year. There have been some cancellations of orders in this district, but the aggregate is not large. Sales in the past week are equal to a very small part of the make, but business on books call for a large tonnage during the last quarter. Inquiries still indicate there is need for pig iron. No general reduction in quotations is noted, the basis being $42 per ton for No. 2 foundry (1.75 to 2.25 silicon). Production figures for the past month will compare favorably with those of the previous month. The Tennessee Coal, Iron & Railroad Co. by reason of the interrupted fuel supply has banked fires in two furnaces at Bessemer. Repairs will be made.

Warehouse Prices

Decline as Demand Continues to Fall —Shipments Are Better

Cleveland, Oct. 5.—Considerably lessened demand from manufacturing interests in this district has caused leading warehouse jobbers to put into effect new prices on practically all material out of stock. This refers to independent jobbers, the Steel corporation still naming the low prices which have been in effect for more than a year. One large independent jobber who a week ago reduced its quotations on structural shapes and plates to the level of the Steel corporation, a few days later lowered its quotation on steel bars, and now quotes at 3.85c. Other independent jobbers are quoting higher, and the maximum is about 4.00c. Other material has been reduced, the leading dealer in sheets now quoting blue annealed at 6.75c, black at 8.50c and galvanized at 9.50c. Dealers state that demand from manufacturers has fallen off considerably, and one jobber reports most of its business is coming from the tinning trade. Transportation has improved considerably, but as yet jobbers have not been in a position to stock material to any great extent.

Price Reductions Feature

New York, Oct. 4.—Reductions by many jobbers featured the local warehouse market during the past week. Virtually all descriptions with the exception of cold rolled material were affected. While a softening tendency has been in evidence for some time, reductions have not appeared general until this week, the heavier declines being made by the smaller interests.

Chicago Prices Unchanged

Chicago, Oct. 5.—In spite of decline in quotations on steel products from store at points further east, Chicago stores are maintaining their figures unchanged from those which have prevailed for some time. Better deliveries from mills have resulted in demand becoming somewhat less, but there is still sufficient business to keep warehousemen busy and prevent them holding enough material to fill up their assortments.

Coke Prices Are Steady

Continuance of High Levels Attributed to Irregularity of Car Supply in Connellsville Region—Current Sales Light

Pittsburgh, Oct. 5.—Prices of spot furnace and foundry coke during the past week have remained unchanged, the former being quotable at $16.50 to $77 and the latter at $17.50 to $18. Sales have been light and shipments against contract are in greater volume. Most of the sales of spot furnace coke have gone at $16.50, although some are reported at $17. Standard foundry coke is said to be scarce but at the same time inquiry is limited. No contracting for the last quarter is being done for either furnace or foundry fuel. The continued high prices of coke which are being maintained in the face of a declining iron and steel market are attributed to the irregularity of car supply in the Connellsville region and the resulting restricted output. Labor in that district also is said to be unsatisfactory. The varying character of car placement is shown by the fact that placements on the Monongahela railroad made Oct. 5 by the Pittsburgh & Lake Erie was 154 per cent, while placements by the Pennsylvania railroad was only 13 per cent. The latter placed 60 per cent on its southwest branch, running from Greensburg to Red Zone Junction, Pa., and about the same percentage on its Red Zone branch running from the Red Zone Junction to Brownsville, Pa. The situation on the Pennsylvania line is easier as a result of the listing of its embargo in the central region Friday night, allowing free movement of all kinds of freight through Pittsburgh, Erie, and Buffalo. According to the *Connellsville Courier*, production of coke in the Connellsville region for the week ended Sept. 25 was 202,840 tons as compared with 200,930 tons for the preceding week.

Spot Demand Falls Off

New York, Oct. 4.—Demand for spot coke at present is less than it has been in some time, but spot offerings also are smaller. The Connellsville market is easier, sales of spot foundry having been made in the week at prices ranging from $17.50 to $18.50, Connellsville. One of the large beehive makers is understood to be offering foundry coke for shipment over the first half at $15, Connellsville. Some spot beehive furnace coke has been sold during the past week at $17, Connellsville. The New England Coal & Coke Co. has taken some first half business on the basis of $21.70, delivered to most New England points, and it will take first half business in this district at $18.30, ovens. For the first time in some months, sellers are taking export coke inquiries seriously. Quotations have been submitted on about 2000 tons of export foundry coke.

First Half Books Opened

Boston, Oct. 4.—Both of the New England by-product producers have opened their books for first half foundry coke. The Providence Gas Co. quotes $24.75 as a flat rate in the $2.50 freight rate zone. The New England Coal & Coke Co. is offering first half foundry coke at $23.70 on a flat rate within a $3.40 zone. Both interests are understood to be open for sliding scale contracts based on prices prevailing about the first of each month. The Providence Gas Co. has a unique clause in its sliding scale contracts. Prices which are to be based on Connellsville prices are to be limited to a spread of from $15.50 minimum to $19.50 maximum at Connellsville, plus the freight prevailing from there to New England at time of delivery. The New England Coal & Coke Co. has just announced a reduction in its current price of foundry coke from $23.70 to $22.70 effective at once on all October deliveries.

Offer First Half Foundry at $14

Philadelphia, Oct. 5.—Eastern users are having difficulty in getting coke delivered, due to a shortage of motive power on eastern railroads, notably the Pennsylvania. Sales of spot foundry coke were made in the week at $17.50 to $18.50, Connellsville, and spot furnace at $17. A leading Connellsville interest is soliciting first half foundry contracts at $14, Connellsville.

Prices Are Holding Up

Cleveland, Oct. 5.—Coke prices have been holding up quite persistently. After having obtained as low as $16.50 a week ago, from ovens able to ship in certain directions, a leading consumer within a few days has paid $17 for from 20 to 30 cars of prompt furnace coke. Spot Connellsville foundry coke is being quoted $18.

Easier Situation at St. Louis

St. Louis, Oct. 5.—Delivery in September from the eastern coke fields was more efficient than at any time since transportation was disorganized by the war. In some instances the full September quota of dealers was received before the middle of the month. The improvement is attributed in part to the anthracite strike which released many coal cars for use in forwarding coke. After contract quotas had been received, however, it was found that ovens had very little more to ship. A number of orders for immediate or reasonably prompt shipment were refused by some makers.

Southern Needs Supplied

Birmingham, Ala., Oct. 5.—The needs of coke consumers in the Birmingham district are being met. The strike in the coal fields of Alabama is beginning to clear up, and a steady improvement in production is noted. By-product coke is steady. Two or three independent companies producing coke are being offered contracts, but there is no report of new business being taken. Coal production for last week in Alabama went above the 250,000-ton mark. The minimum weekly output during the strike has been 197,079 tons. The legislature has passed a bill providing for a fuel administrator and the coal operators have promised to surrender a certain proportion of their output for state distribution and price fixing.

Bar Demand Is Lighter

Implement Manufacturers Hold Up Deliveries in West—Mills Well Booked—Leading Wire Maker Advance Shafting

Chicago, Oct. 5.—Comparatively little activity is possible in soft steel bars in this district, with both the Illinois Steel Co. and the Inland Steel Co. fully sold for the remainder of this year and entirely out of the market as a result. Some selling is being done from time to time by independent producers and quotations are considerably under figures asked in recent weeks. While it is not certain that as low as 3.00c, Pittsburgh, has been quoted, it is believed at least one eastern interest has named that figure for moderately nearby delivery. Under the circumstances most buyers are waiting and pressure for delivery on present contracts is more marked than eagerness to make further contracts.

Agricultural implement manufacturers continue to request suspension of deliveries of steel due on contracts. In many instances they are reducing their orders owing to a curtailment in their manufacturing program. In some cases agricultural implement manufacturers now are operating on the basis of 60 per cent of capacity.

Selling of bar iron about equals production in the case of most makers here, and inquiry continues strong, with railroads taking fair tonnages, although much remains to be desired from this source. For the most part 3.75c, Chicago mill, is being quoted by producers here, although at least one interest is quoting 4.00c, Chicago, on lighter sections.

Hard steel bars rerolled from rails are unchanged at 4.00c, mill, with production on the basis of one turn, because of shortage of rails, which are almost unobtainable. Demand for this material is somewhat slow, although implement manufacturers are taking considerable.

Small Sizes Hold Firm

New York, Oct. 4.—While the steel bar market generally is somewhat easier than it was recently, this does not apply to small sizes of bars. Bars ranging from ¼-inch to 5/16-inch continue scarce and it is difficult to get these for prompt shipment at less than 4.00c, base, Pittsburgh. The market generally on steel bars for prompt and nearby shipment from the mills may be quoted at 3.75c to 4.00c, base, Pittsburgh, although large bars can be had at 3.25c and 3.50c. In some cases, however even large bars are bringing as high as 4.00c, for prompt shipment. The time of delivery is an important factor in respect to prices. Bars of forging quality now may be had for nearby shipment at 4.25c to 4.50c, base Pittsburgh.

The 5.00c, Pittsburgh, price noted recently on iron bars has disappeared, with the market now at 4.50c, Pittsburgh, or 4.88c, New York.

Eastern Market Quiet

Philadelphia, Oct. 5.—Demand for steel bars is quieter than in a long time, but due to larger order books the minimum on light bars for early shipment is 4.00c, Pittsburgh. In some cases where consumers can wait a few weeks for delivery they can obtain quotations ranging from 3.25c to 3.75c. Several small bar orders have been placed by the railroads. Nut, bolt and rivet makers now are well booked up with fourth quarter contracts.

Demand Is Lighter

Pittsburgh, Oct. 5.—Demand for both iron and steel bars is lighter although it still is active, particularly for the smaller sizes. Makers are committed for the remainder of the year and some of them into the first two months of 1921 on the smaller sizes. In view of their strong position, prices remain firm and reports that lots have been sold at considerably under the prevailing quotations do not find support at the hand of makers but some of the higher levels seem to have disappeared. Independent prices on merchant steel bars vary generally from 3.25c to 3.50c. One independent has reduced its price from 3.50c to 3.25c, base. Agricultural implement makers who have begun to make inquiries for first half contracts are showing an attitude of hesitancy because of the high quotations and are making efforts to get the material at lower prices. Demand for refined bars, which are quoted at 5.00c to 5.50c, is fair and the market firm. Railroad buying is light.

Cancellations Reported Small

Pittsburgh, Oct. 5.—Makers of nuts, bolts and rivets report cancellations they are receiving are of a minor character and a fair volume of new business is being taken. For the most part they are committed for the remainder of the year. They report better movement of merchant steel bars to their plants and of their finished commodities to consumers.

Will Not Reduce Prices

Pittsburgh, Oct. 5.—Some makers of cold-finished steel bars have declined to reduce prices on contracts or on current tonnages as requested by automobile manufacturers. The American Steel & Wire Co. now is quoting 4.00c Pittsburgh which represents a recent advance of $8 per ton. Like other steel interests, producers claim the business was placed at fair prices at the time it was closed and are unable to accept the suggestion that prices be reduced. There also has been some resentment by steel manufacturers that the automobile interests cut prices first and then requested the steel producers to "cooperate" with them. Cancellations and suspensions by the automobile trade still are coming to mills but not in so great volume as they have been. Some mills have insisted that when suspensions are requested the buyer either name a specific date as to when shipments are to be resumed or to entirely cancel the business. In certain instances automobile makers have said they were unable to set a definite date and in view of the attitude of the mill have asked the tonnage be canceled. The let-up in the automobile demand has afforded better shipments to other consumers and convenience. Operations are almost at capacity and some producers report that had it not been for embargoes, shipments in September would have been the largest in their history. While some small lots have been sold at 6.00c, the generally quoted range is from 4.10c to 4.25c.

Shipping Against Contract

Pittsburgh, Oct. 5.—Being well booked and taking practically no new business, makers of hoops and bands are devoting their attention to the matter of making shipments against contracts. The Steel corporation price is 3.05c, Pittsburgh, while the independent price is 5.50c.

Rail Bookings

Tentatively Taken at Chicago Exceed 500,000 Tons—65,000 Cars Placed

Chicago, Oct. 5.—Standard steel rails for 1921 delivery asked by western roads have been tentatively accepted by the Chicago rail mill to the extent of more than 500,000 tons. No contracts have been executed and no price is named but the roads have been assured they will be taken care of to the full extent of the mills' ability. Present tonnages on mill books will cover production for about two months of next year, which will reduce new tonnage possible to book for next year's rolling.

Inquiry for railroad cars continues to come out, but buying is slow to develop. The St. Louis, Brownsville & Mexico railroad is inquiring for 550 box cars, the Central of Georgia 500 box cars, 200 gondolas and 100 stock cars, these two inquiries involving about 7500 tons of steel. The Los Angeles & Salt Lake railroad is inquiring for 18 passenger cars, requiring 350 tons of steel.

The Seaboard Air Line has placed 300 phosphate and the Atlantic Coast line 400 coal cars with the Mt. Vernon Car Mfg. Co. The Missouri, Kansas & Texas inquiries for 3500 cars remain unplaced.

Week Passes Without Orders

New York, Oct. 4.—Car demand is negligible, with little promise of any substantial business within the near future. During the past week no orders were reported and inquiries were small and scattered, and included a list of 25 miscellaneous cars for the United States Smelting, Refining & Mining Co. During the past month car inquiries numbered 11,000 and orders 1200. In the locomotive market, inquiries totaled around 250 locomotives and orders approximated 325. The largest domestic order was that of the Baltimore & Ohio, comprising 50 locomotives. The Baltimore & Ohio also closed on the largest car order, placing 750 cars. Outstanding among car inquiries were those of the Wheeling & Lake Erie, totaling 3000 cars.

During the eight months up to and including August, the railroads of the country are reported to have placed orders for 65,000 cars. Coal cars lead all in the percentage of new equip-

ment ordered, amounting to 29.44 per cent. Box cars come second with 21.22 per cent, and refrigerator cars third with 16.47 per cent. These made up 67.13 per cent of the new orders. In the same period, the New York Central railroad repaired and restored to service more than 100,000 freight cars.

Recent locomotive orders of the American Locomotive Co. include 15 for the Canadian Pacific railroad; 50 for the Paris-Orleans railroad; 12 for the Rhodesian railroad; and two for the Toledo terminal. The Baldwin Locomotive Works has taken an order for 10 engines from the St. Louis Southwestern. The 1921 budget of the Great Northern railroad includes 50 locomotives and 1500 miscellaneous cars.

Interest in 1921 Prices

Pittsburgh, Oct. 5.—Interest is being manifested in 1921 prices for standard rails to be adopted by both the leading interest and independents following the action of one independent producer in a nearby district who is said to have named a quotation of $60. An independent interest has reduced its price on angle bars from 3.25c to 3.15c, Pittsburgh. Independent prices on light rails, 25 to 45-pound size, range from 3.25c to 3.75c, mill, but buyers are showing more caution Fair inquiry also is being made for standard spikes which are quoted at 4.00c to 4.25c. Bolt and barge spikes are quoted at $4 to $5 per 100 pounds in car lots of 2000 kegs or more.

Firm Market

Is Maintained in Mill Pipe—Columbus Wants Tonnage

Pittsburgh, Oct. 5.—Makers of iron and steel buttweld and lapweld pipe report that demand is insistent as ever and that they are compelled to decline a considerable volume of new business offered. They are heavily committed and while operations have shown some improvement they still are considerably under capacity. Prices remain firm, and this is one of the few commodities in regard to which reports of shading are heard. There has not been any evidence that levels could be shaded in view of the strong position of the mills. The National Tube Co. still is producing almost at capacity but is forced to pile tonnage owing to a shortage of cars. The order of the interstate commerce commission extending until Oct. 10 the date for the use of pipe mills in the Pittsburgh and valley districts 60 open top cars daily regardhas been of considerable servless of the height of their sides goods. Manufacturers hope the order will be continued.

Figure 4400-Ton Job

New York, Oct. 4.—Eastern cast iron pipe manufacturers are figuring on 4400 tons of 30 to 42-inch pipe for Columbus, O., bids on which are to be in Oct. 19. This represents by far the largest municipal tonnage now before the shop. There is little private demand, as compared with that of recent weeks. Prices remain unchanged.

Plates Are Sold at 3.00c

New York Car Builder Takes 5,000 Tons—Similar Price Reported at Chicago—3.25c Now Is Quoted Freely

New York, Oct. 4.—One of the most important buyers in this district placed a considerable tonnage of sheared tank plates and boiler steel during the past week for prompt delivery, at 3.25c, base, Pittsburgh, for the tank steel, with the usual differential applying to the boiler steel. This transaction is of considerable interest in view of the fact that another large New York buyer, about a week ago, closed for a considerable tonnage of universal and sheared tank plates for export, at 3.00c, base Pittsburgh. Current inquiries call for a few thousand tons of plates, which are expected to be placed shortly.

Eastern Market Gains Strength

Philadelphia, Oct. 5.—Among outstanding features of the eastern plate market are three sales of Lloyds ship plates, including one lot of 1500 tons, at 3.25c, Pittsburgh, plus 10 cents extra. About three or four weeks ago the extra on these plates generally was being waived. While new business has been slow lately, it is surprising how small orders have formed large aggregates. The same eastern mills which one month ago had bookings sufficient for only one or two weeks now have enough to keep them busy four to six weeks. For this reason mills are not so willing to cut prices as they were, and 3.25c, Pittsburgh, apparently represents the bottom price on nearby shipments.

Market Is Softer

Pittsburgh, Oct. 5.—That the market for plates is softer is indicated by the fact a prominent independent producer has reduced its base price on universal tonnage from 3.50c to 3.25c, Pittsburgh, while maintaining its quotation of 3.50c on sheared plates, although it is believed that it would shade these levels on attractive lots. Further evidence of the easier tone of the market lies in the fact an interest in this district has bought a round lot of sheared plates for shipment in three to four weeks from an independent mill at 3.15c, Pittsburgh, the tonnage to be used in tank construction for oil refineries to be built in Oklahoma. This sale is accepted as one of the most specific evidences of the easier tone in the market. Investigation of reported tonnages sold at 3.00c leaves these without verification. A few limited purchases by car builders are understood to be for repair work rather than for new equipment. One consumer who had out an inquiry for approximately 6000 tons of sheared plates was quoted 3.50c but declined to take the tonnage and it is understood expects to obtain it at 3.15c or less.

Ship Tonnage in Sight

Cleveland, Oct. 5.—Some lake shipbuilders are feeling out the market on ship steel but no definite tonnages have been mentioned. Several mills now will quote 3.25c rather freely on plates and it is intimated that lower might be done on an attractive lot as practically all producers are in need of tonnage of this character.

Chicago Market Quiet

Chicago, Oct. 5.—With heavy prospective tonnages for car building and other purposes, the plate market in the Chicago district is living more on promises than actual new business. On reservations for 27,000 tons for car repairs for the New York Central lines, options for 21,000 tons have been exercised and the remaining 6000 tons is expected to be taken up soon. The leading interest continues its former quotation of 3.03c, Chicago, and occasionally books some tonnage from old customers for fourth quarter specification but is not taking on much added business at present. The Inland Steel Co. continues to quote 3.63c, Chicago, as its minimum, but demand is not sufficient to bring much business. Independent mills in the East which have been taking more or less business for prompt delivery are quoting at a lower level and unverified report states that plates have been quoted as low as 3.00c, Pittsburgh, by some of these interests.

The American Car & Foundry Co. has placed with the Illinois Steel Co. 8000 tons of plates, shapes and bars for cars for the Pere Marquette railroad, at 2.65c, base Pittsburgh, for the plate, 2.45c for the shapes and 2.35c, for the bars.

The Western Steel Car & Foundry Co. has placed with the same producer 7500 tons of plates, shapes and bars for cars for the Chesapeake & Ohio railroad on equal basis.

Announce Program

Of Iron and Steel Institute Eighteenth General Meeting

The American Iron and Steel Institute's eighteenth general meeting is to be held at the Hotel Commodore, New York city, Friday, Oct. 22. The morning and afternoon sessions, as usual, will be devoted to the reading and discussion of papers and the evening will be set aside for the banquet. The following program is announced:

Address of The President: Elbert H. Gary, chairman, United States Steel Corp., New York.

Thrift in Coal: George Otis Smith, director, United States geological survey, Washington, D. C.

Recent Developments in The Iron and Steel Industry of India: C. P. Perin, New York.

Foreign Trade: A. H. Holliday, manager of exports Jones & Laughlin Steel Co., Pittsburgh.

The Basic Open Hearth Process: F. L. Toy, superintendent open hearth department, Homestead works, Carnegie Steel Co., Munhall, Pa.

A Review of The Development of Copper Steel: D. M. Buck, metallurgical engineer American Sheet & Tin Plate Co., Pittsburgh.

The Use of Residual Manganese in Steel Making: F. A. Wheaton, superintendent Open Hearth department, Bethlehem Steel Co., Bethlehem, Pa.

Heat Treatment of Automobile Steels: R. R. Abbot, Peerless Motor Car Co., Cleveland.

The Blast Furnace Hearth: Walther Mathesius, superintendent blast furnaces, Illinois Steel Co., South Chicago, Ill.

Scrap Decline Continues

Weakness Emphasized in All Districts, with Concessions as Great as $3 Made in Some Grades—Scarcity of Steel Rails Noted at Chicago

FOR COMPLETE SCRAP PRICES SEE PAGE 1028

Chicago, Oct. 5.—Decline continues in practically all grades of iron and steel scrap at Chicago, 50 cents to $1 per ton having been the recession during the past week. Much of this slipping is due to the efforts of dealers to get under cover material reaching them from outside sources for which they have no means for disposal. This material is being offered at concessions, and the result is a constant lowering of prices. Consumers are not interested in the market, and are taking practically nothing, which causes tonnages offered by railroads and other producers to back up and make the market topheavy except for such material as dealers can apply on contracts. Steel rails constitute about the only grade of scrap difficult to obtain and some consumers believe there never was so keen a shortage in the history of the industry as at present, as they are unable to obtain sufficient to operate their plants more than half capacity. Railroad offerings at present are not as heavy as formerly and comparatively little is under consideration at present. The Chicago & Northwestern railroad closed a list offering 3700 tons late last week.

New England Prices Slump

Boston, Oct. 2.—The bottom has fallen out of the scrap market in the New England district. One of the largest interests is refusing to buy. Buying is limited almost entirely to the few dealers who have old orders to fill. Some of the sales reported during the latter part of the week show reductions of from $3 to $5 from prices a week ago. Quotations now largely are nominal. Some of the small dealers have been affected by recent credit difficulties in Boston and this has caused them to make concessions. Some dealers who are anxious to pick up bargains under present conditions find the smaller dealers confident of recovery and therefore holding on to their stocks. Stove plate has held up better than most grades, although a $2 reduction is apparent below the price of a week ago. No. 1 machinery, which sold 10 days at $46 has dropped to $38. Heavy melting steel is without any demand but could be bought in limited amounts at $18 to $19.

Prices in New York Market Fall

New York, Oct. 4.—Prices continue to fall in the local iron and steel market. Fully half of them have dropped from 50 cents to $1.50. Heavy melting steel declined $1, now holding at $19 to $20, f.o.b. works. Steel car axles dropped to $39 to $40; old steel shafting to $28 to $29; machine shop turnings to $13.50 to $14; mixed borings and turnings to $13.50 to $14; clean cast borings to $17 to $17.50; and stove plate to $24.50 to $25. Wrought materials and heavy cast scrap are among the descriptions to hold steady. Dealers assert that with the exception of car wheels, which are never very plentiful, they are able to obtain supplies without difficulty, producers having plenty of material on hand which they are offering at concessions. However, consumers are buying little scrap.

Market Is Bolstered

Buffalo, Oct. 5.—Competition among dealers for tonnages of hydraulic compressed sheets and heavy melting steel is keeping the market for these commodities at what is really an artificial quotation. There are about four old orders and large ones for these two grades which were taken more than eight weeks ago and which have not been filled. In order to comply with the terms of shipment, under these, dealers find it necessary to pay from $23 to $24 for hydraulic compressed and $25 to $26 for heavy melting steel. Outside the bidding for tonnages on these two grades, the market is very quiet with few sales. Rejections are less and cars are reported plentiful. Dealers look for a quiet period of at least 30 days.

Auto Price Cut Affects Market

Detroit, Oct. 4.—The iron and steel scrap market in Detroit is dull, largely due to the unsettled condition of the automobile industry following reduction in prices. Auto factories are among the chief consumers of iron and steel in Detroit, and conditions in the automobile trade are expected to be reflected in the scrap market for some time. Mills are busy, however. The general trend of prices has been downward, following a sudden stopping of the buying movement. Heavy melting steel has dropped to $21, and heavy axle turnings are off $2, making a low record for recent months of $18. Machine shop turnings are down to $9.50. Iron car wheels still are quoted at $30, being among the few grades not affected.

Sharp Reductions at St. Louis

St. Louis, Oct. 5.—Further price reductions are noted in the scrap market. Industries in the district have withdrawn from the market, and small dealers are in a stampede to liquidate. So far as mills and foundries are concerned, they will not purchase at any price. To make the weakening movement more emphatic, railroads are offering liberally. Certain grades which only a few weeks ago were scarce and in great demand cannot be sold. Relaying rails, for instance, are freely offered, for the first time in more than a year. About 12,000 tons are for sale in this district. The Clover Leaf railroad placed 3500 tons, and in the hands of dealers are from 6000 to 7500 tons. Rerolling rails, malleable, turnings and borings have declined sharply. The Pennsylvania lines west have out a list including 400 tons of rails and about 2000 tons of miscellaneous scrap, which will be closed Oct. 8. The roads have disposed of considerable scrap at private sale, and at very sharply reduced prices. Scrap dealers are not buying.

Eastern Market Depressed

Philadelphia, Oct. 5.—An easier tone of late in the markets generally has resulted in depressing the scrap trade here. Eastern consumers refuse to buy at this time, except a few unimportant tonnages. A notable feature of the market is the weakness of cast scrap, due to the expectation among scrap interests that pig iron prices are going lower. Dealers say that while mills are not buying they are accepting deliveries on contracts. Prices are generally lower. Heavy melting steel, frog and switch guards are now quoted at $24 to $25; rerolling rails at $38 to $39; cupola cast at $38; stove plate, $26.50 to $27.50, and chemical borings, $23 to $24.

Cleveland Market Dull

Cleveland, Oct. 5.—Recession continues in the iron and steel scrap market, while trading is exceptionally dull. Consumers in this territory apparently are well bought up, and whatever business is being transacted is among dealers. Heavy melting steel is down from $26 and $26.50 to $25 and $25.50 while other materials are shaded as much as $2 a ton. Cast scrap is holding up well.

Continued Dullness Expected

Pittsburgh, Oct. 5.—Indications are that the dullness in the scrap market will continue for some time, dealers expecting no activity until after the presidential election. Consumers appear to be well covered and are getting good deliveries, with few exceptions. Inquiries and orders are extremely limited. The tone of the market is softer, and there have been some moderate reductions in certain grades, but on the whole prices are unchanged. Heavy melting steel is quoted at $28 to $28.50 and several small lots have been sold during the past week at this range. There is practically no demand for compressed sheets which have declined $1 and now are quoted at $23 to $24. Bundled sheets are easier at $17.50 to $18. The market for low phosphorus scrap, billet and bloom crops still is quoted at $34 to $35, one sale of 1500 tons going at $34.50. Sales involving 3000 tons of rerolling rails at $41 also are reported.

Southern Market Weak

Birmingham, Ala., Oct. 5.—Weakness is noted in the southern scrap market. Heavy melting steel has shown some relaxation, and consumers are not offering more than $20. Some melters are asking that shipments on contracts be held up. Foundries and machine shops apparently are waiting for developments in the near future. Readjustments are noted in all prices, some concessions being made. No big contracts are being taken.

Car Lack Hits Strips

Pittsburgh, Oct. 5.—Shortage of cars on the Pennsylvania railroad during the past week has reduced production of hot and cold-rolled strip

steel, one maker having been forced to suspend for one day for this reason. Makers say that cancellations by the automobile trade are about at an end. So far as reported none of them has reduced prices on contracts for the automobile trade but it is claimed that something in this direction may be done. Operations are estimated at 80 per cent of capacity. Mills are committed for the remainder of the year but report that inquiry has fallen off. Operations are estimated at 70 to 80 per cent of capacity. The independent price of cold-rolled strip steel is 8.50c, mill, and of hot rolled strip steel, 5.50c.

Sheet Prices Are Lower

Pittsburgh Independents Reported Cleaning up Contracts—Valley Market Slightly Firmer—Good Demand Still Noted at Chicago

Pittsburgh, Oct. 5.—Certain independent producers of sheets are understood to be quoting lower prices than those which have been current, following the lessened demand from the automobile trade. Some of these interests are understood to have cleaned up contracts at the higher levels which previously existed, or to have found their bookings reduced considerably by cancellations. The market for No. 28 black sheets for early shipment appears to be quotable at 7.25c and it is said that attractive tonnages might be bought at 7.00c. The maximums which have been prevailing on No. 28 tin mill black sheets, which went as high as 9.00c, have become easier and now the market for this grade seems to be quotable at 8.25c to 8.50c. One independent interest is said to be quoting 8.00c on No. 28 galvanized sheets, although the general quotations for new business still are 8.25c to 8.50c. The demand for No. 10 blue annealed sheets quoted at 5.50c is lighter than that for the other grades. Operations of sheet mills the past week showed a slight decline, due to a shortage of sheet bars, and are estimated at 80 per cent.

Slightly Firmer Tone in Valley

Youngstown, O., Oct. 5.—A firmer tone has developed in the market for sheets, and business has improved slightly in the valley. A few scattered orders and several inquiries ranging from 25 to 200 tons have been received. While stocklists are being issued freely by several sheetmakers in this and other districts, their contents show that little tonnage of stock sizes and gages is available. Heavy gages of blue annealed continue weak. The lighter gages, however, are in fair demand and are being quoted at 6.00c. Gages ranging from 10 to 14 are held at 5.00c. The market for black is between 7.00c and 7.50c. Last week one maker was quoting 6.50c on this grade for the reason that he lacked orders for certain specifications. This quotation now has been withdrawn, 7.00c being the minimum. Makers of galvanized are asking between 8.25c and 9.00c. Few mills are willing to take on galvanized business lighter than 24 gage.

Eastern Market Easier

Philadelphia, Oct. 5.—The sheet market is easier. Most gages of blue annealed can be had at 5.50c base Pittsburgh, for fairly quick shipment, while No. 12 gage and heavier can be had as low as 5.00c Black sheets can be had at 6.75c to 7.00c, base, and galvanized of all gages at 8.50c, base. Current business comprises mainly small tonnages for this year, but at customers' requests several contracts have been booked for the first quarter.

Good Demand At Chicago

Chicago, Oct. 5.—Consumers of steel sheets continue in the market for tonnages and mills could book considerably more business if they could make of 1921. Irregularity in quotations by eastern independents, who can give reasonably prompt delivery, makes the market somewhat uncertain, but it appears that No. 28 gage galvanized can be placed at 8.50c, Pittsburgh, No. 28 gage black at 6.50c to 7.00c, Pittsburgh.

Bessemer Ore Needed

Some Furnaces Reported Short of This Grade—Large Consumer Makes Inquiry—All Want Full Deliveries—More Vessel Chartering at $1.50

Cleveland, Oct. 5.—Shipments of iron ore from the Lake Superior district in September amounted to 8,923,482 tons, an increase of 744,999 tons over shipments in September, 1919. The total movement for the season to Oct. 1 was 44,273,356 tons, an increase of 6,496,825 tons over the same period in 1919 and a decrease of 3,956,153 from the total for the period in 1918. The total to Oct. 1, 1920, indicates the season's shipment will amount to approximately 57,000,000 tons, while the leading operators say the market this year was sold to the extent of from 62,000,000 to 64,000,000 tons. The difference in tonnage between actual deliveries and contracts seems to be larger, in the estimation of some of the producers, than is generally allowed by furnace interests for surplus.

The following comparison just compiled throws additionals light on the ore situation:

	Interior furnaces Central district	Eastern furnaces	Lake front furnaces	Total
Ore consumed in July	2,483,636	237,907	1,720,165	4,491,708
Ore consumed in August	2,575,780	328,915	1,739,843	4,644,536
Increase in August	92,144	41,008	19,678	152,830
Ore consumed in August, 1919	2,600,410	223,007	1,481,195	4,304,612
Ore on hand at furnaces Sept. 1, 1920	8,585,438	2,420,878	12,318,710	23,328,026
Ore on Lake Erie docks Sept. 1, 1920	8,158,852	395,603	.....	8,554,455
Total ore on hand at furnaces and Lake Erie docks Sept. 1, 1920	16,747,290	2,816,481	12,318,710	31,882,481
Total ore on hand at furnaces and Lake Erie docks Sept. 1, 1919	19,644,621	2,720,248	10,349,943	32,714,812

One of the largest furnace companies in Ohio is asking for a round tonnage of bessemer ore, of which there appears to be a general shortage. This furnace is covered by contract, but has received intimations that full contract deliveries cannot be made, and is endeavoring to place an order with other producers. The requirements were estimated at 100,000 tons. The producer to whom the inquiry was made stated that there was no chance of it being able to supply the demand. Further chartering of vessel tonnage at $1.50 is reported.

The representative of a leading ore shipper who has just returned from a trip through the East, states:

"The general impression among the furnace people seems to be that they are not receiving the ore tonnages they will need, although future operating conditions, of course, will determine whether or not their supplies will be sufficient. Two Pennsylvania interests, in particular, emphasized the fact that at the present rate of shipments they will experience a shortage on contracts and will have to seek additional supplies in the open market. Practically all of the furnace people I met were commenting on the reports they had received to the effect that there is a shortage of cars to carry ore from Mesabi mines to upper lake docks, and that this, as well as difficulties in the lower rail haul, will be a factor in late shipments."

This same representative reported having received an inquiry from an Ohio furnace this week for 75,000 tons of ore. Another large shipper states it knows of but one active inquiry for a "pretty fair" tonnage of ore at present, these not being among those previously referred to.

Another important ore producing interest reports:

"We expect to deliver from 80 to 90 per cent of the 7,000,000 tons of ore we have contracted to sell. Some of the leading operators state that they will be able to make 100 per cent deliveries, but a careful inquiry shows that but very few if any will succeed in making such deliveries. The shipping records show they will not. Rail shipments to interior furnaces have improved considerably in the last few weeks but they are only 75 to 80 per cent of normal. Sufficient ore probably will be delivered to lower lake docks for all requirements, if the present lake shipping movement continues as expected, but the ore will not be in furnace yards, and the furnaces which have business on their books to keep them going at their present rate are expressing some fear that they will not be able to get it shipped through to them. They are urging all the ore men to hurry shipments.

Quote Lower on Shapes

Independent Mills Name 2.90c at New York and 2.85c Is Reported at Chicago—Little New Work Going Through

New York, Oct. 5.—Prices quoted by independent shape mills have sagged off to 2.90c, Pittsburgh, at least in one instance. This figure has been done on a sizable tonnage for delivery over this and the fourth quarters. While 3.25c still is said to be quoted, it is believed that little if any business is being booked at that figure. The local structural shape market is devoid of sizable orders, with little new inquiry of consequence. In fact, the situation appears as dull as it has been in months, and is featured by a continued downward tendency in prices. One fairly good sized lot of shapes for spot shipment has just been closed at 3.10c, Pittsburgh.

Work Is Held Up

Boston, Oct. 4.—The uncertain banking situation in Boston recently has caused several of the larger construction jobs to be held up. Contract for a hotel in Providence which will take approximately 2000 tons of steel has been let to the Fuller Construction Co., New York.

Eastern Market Continues Dull

Philadelphia, Oct. 5.—Business in the shape market continues slow and considerably below the rate of current shipments. The minimum price of standard shapes here is 3.10c, Pittsburgh. Structural shape demand is restricted to a few small lots.

Market Continues Dull

Pittsburgh, Oct. 5.—Dullness in the market for strucural sapes continues to prevail and there is practically no inquiry or new business. An independent maker in this district has taken approximately 3000 tons for early shipment at 3.10c, Pittsburgh. Independent prices range from 3.10c to 3.25c, Pittsburgh, but the latter seems to have almost entirely disappeared in view of the action of several interests in reducing their prices from $3 to $5 a ton. Fabricators are getting better shipments of plain material but report no improvement in the way of new inquiries and orders, although contracts for several small jobs have been taken. Operations are estimated at about 80 per cent of capacity.

Compete for Bank Tonnage

Chicago, Oct. 5.—Most interest in the structural market at present centers about steel for the Federal Reserve Bank building in Chicago, plans for which have been made by Graham, Anderson, Probst & White, on which figures have just been taken. This structure will require an estimated 8750 tons of structural material. While fabricators able to handle a project of this size are anxious to bid for it, the present price situation indicates that the tonnage probably will go to the leading interest, since independent fabricators apparently cannot meet its figures. Figures somewhat under those prevailing in most instances have been made by some independent mills in an effort to get this business on a delivery and price concession. It is believed some of these figures have been as low as 2.85c, Pittsburgh, for shapes and close to 3.00c, Pittsburgh, on plates.

CONTRACTS AWARDED

High school building, Fredonia, N. Y., to Kellogg Structural Steel Co., Buffalo, 300 tons.

Addition to Buffalo Corrugated Car Co., Blasdell, N. Y., to Kellogg Structural Steel Co., Buffalo, 200 tons.

Material for ore dock, for Chicago & Northwestern railroad Co., Ashland, Wis., 910 tons, to American Bridge Co.

Seamless tube rolling mill for Steel & Tube Co. of America, Indiana Harbor, Ind., 707 tons, to McClintic-Marshall Co.

Building for Champion Fibre Co., Canton, N. C., 450 tons, mill not given.

Building for Nair Linoleum Co., Newark, N. J., 500 tons to Cambria Steel Co.

Building for Robert Gair Co., Montville, Conn., 500 tons, mill not given.

Government cranes, involving 800 tons, to the Wellman-Seaver-Morgan Co., Cleveland.

Hotel Providence-Biltmore, Providence, R. I., 2000 tons, to the George A. Fuller Co.

CONTRACTS PENDING

Highway bridge in Chatham county, North Carolina, 400 tons, bids asked.

Bridge for Central railroad of New Jersey, 250 tons, pending.

Concrete Bars Quiet

New York, Oct. 4.—While domestic demand for concrete bars now is quiet, export trade continues heavy and a good business has been booked lately, particularly for South American countries and for China. This business is being taken at domestic prices. It now is easier to obtain deliveries so that the recent extreme premiums for spot material in New York no longer are being paid. On spot and nearby shipments from mills, prices range from 4.00c to 4.50c, base Pittsburgh, although the inside figure is exceptional. It is possible to place orders for concrete bars for shipment in three or four months at 3.25c, base, Pittsburgh.

Market Is Listless

Pittsburgh, Oct. 5.—No activity has developed in the market for reinforcing concrete bars and there appears to be no prospects of a buying movement in the near future owing to the stagnant condition of the building trades. The generally quoted price on small bars rolled from new billets is 4.25c, mill, while on the larger sizes it is 4.00c. Bars rolled from old rails are quoted at 3.75c.

Resale Ferro

Sold at $150 Delivered—No Inquiry for Next Year's Delivery

Pittsburgh, Oct. 5.—An inquiry put out by a southern consumer for 1000 to 2000 tons of ferromanganese for either spot or nearby delivery is understood to have been made for the purpose of testing the market. Makers still quote $170, tidewater, but it is reported that resale lots have been sold as low as $150, delivered. In view of the report that the strike of coal miners in England has been postponed two weeks, the market has a softer tone. Had the strike occurred as scheduled it would have shut off importations of ferromanganese. There is almost a complete absence of inquiries and new orders.

The market for 18 to 22 per cent spiegeleisen is quoted at $80, furnace, for either spot or forward shipment. A maker in the East is said to have recently closed for 300 tons for early delivery at the level named. A producer which had been quoting $85 has reduced his price to $80, furnace.

No Demand for 1921

New York, Oct. 4.—Several hundred tons of spiegeleisen have been sold during the past week at regular market prices, which may be quoted at $82.50, furnace, for 19 to 21 per cent, and $80, for 16 to 19 per cent metal. All of this business is for shipment this year. So far there has not been any demand for next year. Demand for ferromanganese is almost entirely lacking, and not even spot carload sales have been reported during the past week. Prices are unchanged. First hands continue to quote on the basis of $170, tidewater, for standard metal, while resale ferromanganese continues obtainable at $160 and $165, tidewater. New demand for high grade ferrovanadium has been fair, with business at $8.25 to $8.50, as against $9 a pound contained at the peak this summer. Ferrovanadium which runs rather high in silicon continues quoted $6.50 a pound contained. Ferrotungsten is in light demand, with domestic production almost negligible, it is reported. Foreign alloy is obtainable at 70 to 80 cents a pound contained, while domestic producers are quoting 90 cents to $1. Tungsten concentrates are almost a drug on the market at $4.50 to $5 a unit. Ferrochrome is quiet, with domestic producers quoting 18 to 19 cents a pound contained for material containing 6 to 8 per cent carbon, and sellers of foreign alloy asking 16 to 17 cents for small lots from New York store. Fifty per cent ferrosilicon has remained steady at $82.50 to $85 delivered. Production has been on the decline.

Foreign Manganese Ore at 60c

Philadelphia, Oct. 5.—The eastern market for high grade foreign manganese ore is nominal at 60 to 65 cents, tidewater. In some cases offers are made at 60 cents. Spot carload sales of spiegeleisen were made here in the market at $82.50, furnace, for 20 per cent. Loss in production of ferromanganese is threatened by poor coke shipments, resulting from lack of railroad motive power.

Insistent Demand

Continues in Wire and Nails—Cannot Accumulate Stocks

Pittsburgh, Oct. 5.—Makers of wire and wire products report that demand continues to be as insistent as ever, and particularly so with regard to plain wire and nails. Suspensions received are said to be of an unimportant character and to be more than offset by new business. Some

makers have adopted a policy of asking consumers who request suspensions to cancel the tonnags instead, so that it will not be necessary to reserve for them capacity which is needed for other buyers. Independent mills generally have issued their new cards adjusting wire extras to cover increased costs on the manufacture of wire lighter than No. 8 gage by making No. 8 instead of No. 9 gage the base. One independent interest reports that requirements have been coming in so heavily that for the present it has suspended its policy of taking replacement orders. Operations of wire mills are estimated at from 80 to 85 per cent of capacity

Wire Mills Hum

Buffalo, Oct. 4.—The amount of business being done by the largest wiremaker here is enormous. Mills working night and day are sold ahead for entire capacity for five to six months. New tonnage in small lots is being taken on periodically. Wire rope, netting and domestic products are in heaviest demand.

Less Demand for Nails

Chicago, Oct. 5.—Although the keen edge is off demand for wire and nails, manufacturers continue to find more business than they can take on and independent makers have not reduced their premium prices nor improved their terms of delivery. The leading interest naturally has heavy demand, its prices being considerably lower, and conditions are absolutely unchanged in its situation. While production and shipments are much improved over former conditions, the total is absorbed quickly.

Sheet Bar Prices Soft

6000 Tons Placed in Mahoning Valley at $60, Ohio Mill—Billets Available at $55—Semifinished Market Generally Working Lower

Pittsburgh, Oct. 5.—Rumors of sharp breaks in the semifinished market followed by denials have confused the situation. The market is easier, but the softness evidently has not brought it to the levels that some reports would indicate. Several prominent producers insist they have not reduced prices and have no intention to do so for the present but are depending on well filled books to carry them over until the position of the market becomes clearer. Among this class of producers are those who still are quoting sheet bars at $70 and soft 4 x 4-inch billets at $60, Pittsburgh or Youngstown. It is evident, however, that sheet bars can be bought for $65 or less and that billets can be bought for $55 to $60

Common wire rods are in fair demand, and a Pittsburgh interest during the past week has sold a sizable lot at $75, mill. Some producers are quoting $80. The price for high carbon rods ranges from $85 to $100.

Sheet Bars Sold at $60, Mill

Youngstown, O., Oct. 5.—The 6000 tons of open-hearth sheet bars recently inquired for by a consumer in this district were purchased at a price under $62.50 Youngstown basis or $60, mill, the business being taken by a producer outside this territory. Of the various makers who had a chance at this business, only two refused to quote. Bids received from those interested show a range of approximately $11 per ton, the minimum being $59, mill, and the maximum $70, mill. Recent sales of one maker here, however, disclose 12,000 tons of open-hearth sheet bars, which were bought at $75, Youngstown, and 2000 tons at $70, Youngstown. In view of these sales, the market for this grade of sheet bars is quotable between $65 and $70, mill. These quotations represent prices asked by two distinct semifinished makers in this district.

Rerolling Steel Easy

New York, Oct. 4.—In some cases where mills recently were asking $65, Pittsburgh, for rerolling billets, they now are willing to sell at $60. The market for rerolling billets and slabs may be quoted at $55 to $60, Pittsburgh.

Rerollers Sold at $55 in East

Philadelphia, Oct. 5.—Sales of open-hearth rerolling billets, aggregating about 1000 tons, were made in the week at $55, Pittsburgh.

Market is Irregular

Cleveland, Oct. 5.—Irregularity continues to be shown by the sheet bar market. Valley mills in the week have quoted around $63 on pending business and sellers outside that district have done several dollars less at the mill. Several leading sellers of sheet bars, however, continue to hold for $65. Some negotiations continue. Reports of recent sales of 1000 tons of large billets to a consumer in this territory at well below $60 proves that this material was outside the regular specification of the producer and is part of a regular arrangement whereby the consumers takes in lots of this size at a certain differential under the market. A local maker sold 2000 tons of 4 x 4-inch billets for prompt shipment at $60.50, mill, the 50 cents representing a special extra. Three mills quoted $70, Pittsburgh, on a small lot of forging billets in this territory this week.

The Nonferrous Metals

	‡Copper	Future Straits N. Y.	†Lead New York basis	Zinc St. Louis basis	Aluminum	Spot antimony	Nickel ingot
Sept. 29	18.50	43.*5	7.75	7.65	35.00	7.125	43.00
Sept. 30	18.375	43.50	7.75	7.65	35.00	7.125	43.00
Oct. 1	18.375	43.50	7.75	7.50	35.00	7.125	43.00
Oct. 4	18.00	43.50	7.75	7.50	35.00	7.125	43.00
Oct. 5	18.00	42.50	7.75	7.50	35.00	7.125	43.00

*Future shipment from Singapore or London.
†Import, price, duty paid.
‡Producers, price delivered, prompt and October: outside 17.50c to 17.62½c.

NEW YORK, Oct. 5.—Heavier selling pressure and continued absence of demand were reflected in lower prices all through the list of metals the past week. Leading copper producers have marked down electrolytic copper ¼c from the nominal level of 18.75c which obtained for two months up to Sept. 25, to 18.00c, delivered, at which price actual business has been taken by producers. The leading lead producer marked down its lead price ½c a pound Sept. 23 and ½c Sept. 29, bringing the current price to 7.75c, New York. Outside sellers adjusted their prices in accordance.

Western sellers of prime western zinc, needing money apparently, cut prices to below 7.50c, East St. Louis, for October and November shipment. Tin sold down to the lowest levels since before the United States entered the world war. The price of sheet lead was reduced ½c Oct. 1 to 11.50c for full sheets and 11.75c for cut sheets. The base price of copper wire was reduced 1c to 22.00c by one leading mill. Aluminum prices were weak, in a buyer's market. Odd lots sold down to 29.00c, New York, for 98 to 99 per cent virgin ingot, as against 35.00c quoted by the producer. Aluminum sheets were about 5c a pound lower in the outside market at 50.00c to 55.00c, as against 65.00c a few weeks ago. For importation 45.00c could be done.

Some electrolytic copper business has been done by producers at 18.00c, delivered, and this price could be done for delivery all the rest of the year. In the outside market, various prices for electrolytic copper were reported, 17.50c, delivered, being possible. The casting copper business has been slow, as foundries generally are operating under normal and buying from hand to mouth. Ingot metal business also is light.

Prime western zinc has been in extremely light demand, although some sheet mills have lately been rolling a proportionately larger tonnage of galvanized sheets than for some time. A large lot of high grade zinc sold at 8.75c, New York.

The lead market has been lower, due to continued pressure of import metal. Some German offerings were reported as low as 7.00c, c.i.f. New York, duty paid. Domestic producers took some orders at 7.50c, East St. Louis, for October shipment. Spot metal was rather scarce at 8.00c, New York, but lead afloat from abroad could be had at 7.75c, New York. Business generally was light with some cancellation.

The tin market slumped to the lowest prices in nearly four years. Straits sold on the metal exchange Oct. 4 at 42.75c, for October or November delivery, at seller's option. Today spot was down to 42.50c. Future shipments worked down to 43.50c, New York. Some buying of tin by consumers has been looked for on the ground that the tin plate makers will be opening their books for next year shortly and will have to cover on tin. Thus far there has been little buying of tin by any consumer for delivery beyond December.

The antimony market has been quiet, with carload lots quoted 7.12½c, duty paid, New York.

Old metals prices have been soft, recent declines having ranged from ⅛c in copper scrap to 2c in aluminum scrap.

Want Tin Plate

Purchased on Contract, Though New Demand Falls Off

Pittsburgh, Oct. 5.—With the ending of the canning season, inquiries for tin plate have fallen off, but mill interests report that consumers who are covered by contracts for the last quarter are urging deliveries. For the most part this is a class of buyers who have been unable to get shipments because of their diversion to can manufacture. It is reported that one interest has taken some last quarter business at $9 but so far as known, none of the independents have opened their books for the first half, and the leading interest will not do so until about the middle of next month.

Slight Gain in Export Trade

Potential Rail Inquiry Declared To Be Large but Orders Are Not Coming In —Extra Prompt Deliveries Offered by the Mills Check Any Possible Future Ordering—To Deliver Big Pipe Order

NEW YORK, Oct. 4.—"It is the exchange that is beating us," declared a prominent steel producer in describing the present condition of the export market. As a matter of fact this is the most disturbing element, although other steel people declare that there is little business in the market. The exchange situation has grown so serious that a movement is being discussed for a general conference between the exporters and the foreign exchange bankers. What good could be accomplished is not made clear although some exporters hold to the opinion that it is up to the banks now to protect the foreign trade. The drop in exchange has caused many cancellations and the resale material that is now being offered is causing great difficulties. It evidently is the intention of some dealers to get out of the market as soon as possible until conditions become normal.

The mills appear to be holding rather firmly to their prices despite this situation. There has been some rumor of a drop of $5 a ton on billets for export, but it could not be discovered that any actual contract on that basis has been made. Inquiries for export invariably bring out the old prices from the mills. It is the combination of a minimum exchange, a falling market, and a probable decline in prices which causes the present attitude of foreign buyers to hold off.

The new movement to cancel in the export trade started about three weeks ago. It has gained a momentum ever since. Cancellations are coming from all countries. The Orient refuses to extend credits on delayed shipments, and are cancelling even though the goods are loading aboard ship when the letter of credit expires. One Japanese house is now suing an American exporter, alleging the delivery of defective goods on 500 tons of sheets and 500 tons of bars. South America is cancelling on account of the drop in her exchange but in some instances requests are made for delays in shipments. In other cases the South American buyer offers to accept if credit is extended. The American seller frequently is in no position to extend credits, and often he proposes to resell the material rather than adopt the special means to fill the contract.

So prompt are the shipments from the mills now that future buying is discouraged. Some few export inquiries for first quarter delivery have been reported but quotations have not gone forward on these. It is felt that not much future buying will be placed if the old schedule of prices is quoted. There has been little effort toward first quarter buying, due to the prompt shipments which mills are now able to offer.

Many of the independents are attempting to maintain an optimistic attitude. They insist that there has been a vast quantity of unassimilated sales to be absorbed, and declare that it is well to let the foreign markets take up these tonnages before booking more.

One independent house has sold England 1000 tons of skelp. This, as pointed out previously, is nothing unusual and England is partly dependent upon us for that material. Another house has sold England 300 tons of plates. The order was 30 per cent sketch plates, and it was said that they were purchased on a basis of 3.25c, Pittsburgh.

England is inquiring for sheet bars, plates, hoops and slabs in quantities varying from 200 to 1000 tons in an order, but no sales have been made. Exporters are inclined to believe that England is merely testing out the market. England, it is well known, is selling sheets in the foreign market.

There is an indefinite demand in Europe for rails, but no hope is entertained at present of getting any of the business. Belgium is looming up as an export rival of the United States. Belgian nails seem to have knocked the bottom out of the market on that commodity, helped along by the disparity in exchange runs them still lower. Belgian bars are cheaper than the American product in nearby foreign markets, but it is said there are disadvantages on the extras which still affords the mills of this country a chance to compete.

France is inquiring for 300 tons of electrical sheets. An agent is now in the United States looking for this material, which appears difficult to locate. A demand for oil field goods has developed and the United States is said to have a desirable opportunity here as the English material is quoted much higher than ours. One house sold Mexico 8000 tons of pipe. A sale of 1500 tone of pipe to India was reported, although it is believed some of this is intended for China. The Dutch East Indies are buying oil pipe. Sales have been made at 7.50c, Pittsburgh.

The United States Steel Products Co. will begin delivering in December on an order for 15,000 tons of pipe which it recently booked for France. This order includes requirements for an oil pipe line to extend from Havre to Paris, a distance of 132 miles.

Oriental inquries for rails are said to total around 10,000 tons. These are characterized as feelers. Japan has inquiries for 1000 tons of sheets and some wire. That country, however, has purchased five miles of 16-pound rails with portable equipment. The house making this sale has received a Japanese inquiry for light rails, nails and black sheets, the whole amounting to about 1000 tons, upon which first quarter delivery is desired.

It is said that South American business is hopeless until after the first of the year. There is a potential demand from South America for approximately 30,000 tons of rails, but no immedite business is in sight. Argentina is inquiring for a little railroad material. One house has inquiries for approximately 200 tons of bars from Brazil and Argentina. A large independent mill has sold 1000 tons of water pipe to Central America. Cuba is buying wire products and sheets. An independent house sold 900 tons of such material to Cuba.

Ocean Freight Rates

Rates per ton unless otherwise noted

New York to	Pig iron billets, etc.	Steel rails, bars, etc.	Plain wire in coils, etc.	Tin plate
Liverpool	$10.00	$10.00	$12.00	$12.00
London	10.00	10.00	12.00	12.00
Christiania	12.00	12.00	18.00	14.00
Copenhagen	12.00	12.00	18 00	14.00
Hamburg	10.00	10.00	15.00	12.00
Bremen	10.00	10.00	15.00	12.00
Rotterdam	8.00	12 00	12.00	10.00
Antwerp	8.00	8.00	12.00	10.00
Havre	6.00	6.00	12.00	10.00
Bordeaux	8.00	8.00	12.00	10.00
Barcelona	18.00	18.00	25.00	18.00
Lisbon	18.00	18.00	25.00	18.00
Marsailles	15.00	15.00	18.00	15.00
Genoa	12.00	14.00	16.00	14.00
Naples	12.00	14.00	16.00	14.00
Constantinople.	18.00	18.00	22.50	18.00
Alexandria	.....	15.00	.....	15.00
Algiers	.....	14.00	.....	.....
Dakar	20.00	20.00	23.00	20.00
Capetown	20.00	20.00	20.00	20.00
†Buenos Aires	12.00	12.00	12.00	12.00
†Itio de Janeiro	16.50	16.50	16.50	16.50
†Pernambuco..	17.50	17.50	17.50	17.50
‡Havana	.71	.71	.71	.71
Valparaiso	18.00	18.00	18.00	18.00
§San Francisco	1.00	1.00	1.00	.90
Sydney	15.00	15.00	15.00	18.00

†Landed.

‡Per 100 pounds, plus extra charge for wharfage.

§Per 100 pounds.

Steel Outlook

Is Encouraging in Opinion of Topping, Schwab and Gary

New York, Oct. 5.—John A. Topping, chairman of the Republic Iron & Steel Co., who has just returned from a vacation in Canada, stated in an interview today:

"In my opinion the process of deflating iron and steel prices necessarily will be slow, regardless of the movement downward in other lines, because production of iron and steel abroad is restricted by scarcity and high prices of fuel and other influences tending to increase cost and restrict output.

"Stocks of iron and steel products throughout the world are light; therefore liquidation is absent both at home and abroad. In this country fuel scarcity and high prices for coal and coke promise to continue for some time, and there is no present prospect of cost reductions in any direction. In fact, recent freight advances caused material increases in costs, not only in assembling raw materials for manufacture but the cost of transportation in distributing finished products.

"An encouraging feature of the situation is found in the absence of cancellations and the continued urgency for shipmets, although contracting for future wants admittedly is light. However, there are good prospects for future demands as a result of good crops at high prices, which means agricultural prosperity. It generally is conceded, also, that constructive needs both present and future are largely both for housing and transportation requirements, and with easier money tendencies an increase in demand from these sources may be expected. I see nothing discouraging in the present prospects for iron and steel."

Charles Schwab, interviewed at his home in Loretto, Pa., said:

"I am quite in accord with Judge Gary's statements. The steel industry is in a good healthy state. The conditions which make necessary a reduction in prices in certain lines and with certain companies also will tend to lower costs and increase production, and will make for stability and normal operations.

"The railroads of the country under normal conditions consume about one-third of all the steel produced. Railroads during the last five years have ordered nothing like their usual amount, and this deficiency of past years will have to be made up. This added to the railroads' usual consumptions will keep the steel business steady and normal. The same conditions apply to building requirements and other lines of trade."

Rails Should Be Advanced, Says Judge Gary

New York, Oct. 4.—Judge E. H. Gary, chairman of the United States Steel Corp., returned yesterday on La France, after a 10 weeks' vacation in Europe. When asked regarding his plan for American assistance in the rehabilitation of the French steel industry, he said that there was no developed plan so far as he knew. As to the report that the Steel corporation would finance shipments of Spanish ore to French furnaces, he said the question had not been considered. He added:

"Regarding the extent to which France has progressed in rehabilitating industry, facts and figures are not thoroughly digested as yet, so I shall reserve any statement until the semi-annual meeting of the American Iron and Steel institute, to be held the latter part of October. I shall speak at that time on France and Belgium in particular.

"From my information," he continued with reference to the situation in the United States, "I consider the steel industry in a healthy condition, although there has been noticeable diminution in volume and also decrease in prices. So far as the corporation is concerned, conditions and prospects are satisfactory.

"As to the effect of advanced freight rates on steel prices, I hope it will not cause the corporation to advance prices. However, I am not certain as yet just what the effect will be. Prices may be affected to some extent. Rails should be slightly advanced."

At a banquet in Paris, Sept. 11, Judge Elbert H. Gary, as the guest of Francois-Marsal, the French minister of finance, said:

"The people of the United States have kept their eyes fixed on France, who despite all her sufferings has remained a country of order and the very bulwark of civilization against Teutonism.

"Now that victory is achieved we still have our eyes fixed on France and we see her in the front rank ready to collaborate with all her strength for the fight for civilization.

"The peasants of France will build her country up anew. They are the capitalists of France, old men taking the places of fallen youths, having the will to restore France to her strength and bound to succeed much sooner than is commonly thought."

Says Foreign Trade Would End Business Slump

James A. Farrell, president of the United States Steel Corp., told members of the National Foreign Trade council, at its seventh annual meeting at the Biltmore hotel, New York, Sept. 30, that expansion of foreign trade is the remedy for business depression caused here by decreased domestic demands.

"In recent months we have seen various degrees of depression in our business, resulting largely from decreased domestic demands," Mr. Farrell said. "Such a depression might in part have been avoided had our producers shown more desire to add the demands of an understocked world to those of local markets in the United States. A permanent American foreign trade cannot be secured without the serious effort of our business men. They must be induced to equip themselves for foreign trade; to devote some portion of their products to foreign trade, and to demand of the government that willing support of legitimate enterprise to which they are entitled. If we can not obtain from the legislative and executive branches of our government an understanding of those problems with which we are faced, I am confident the American business man can meet foreign competition, if he only appreciates the real need for foreign trade which this country is now experiencing."

The council voted to defer action on the Jones shipping bill until the President had appointed the five remaining members of the shipping board, which at present has a membership of but two. A subcommittee on the bill consisting of Mr. Farrell, P. A. S. Franklin, Welding Ring, Henry Howard and Hendon Cubb was named.

Cleveland was selected as the place of holding the eighth National Foreign Trade convention next spring. The old board of officers was re-elected.

Among those present at the meeting, besides Mr. Farrell, were E. A. S. Clarke, president, Consolidated Steel Corp.; John G. Ryan, president, Anaconda Copper Mining Co.; M. A. Oudin, vice president, International General Electric Co.; Maurice Coster, vice president, Westinghouse Electric International Co.; Henry Howard, Grasselli Chemical Co.; W. L. Saunders, chairman, Ingersoll-Rand Co.; J. R. Flannery, chairman, Vanadium Corporation of America; and Alba Johnson, Philadelphia.

Mill Is Merged

The Union Rolling Mill Co. of Cleveland, operating 8, 9, 18, and 21-inch mills for the manufacture of steel and iron bars, has been merged with the Bourne-Fuller Co., Cleveland, and its plant will hereafter be known as the Union mills of the later company. J. E. Kreps, former vice president and treasurer, and M. L. Hopkins, former secretary of the Union Rolling Mill Co., are associated with the Bourne-Fuller Co. as vice president and secretary, respectively.

The Wadsworth Mining Co. has been incorporated at Montgomery, Ala., with $8000 capital. Officers are E. J. Mitchell, president; Z H. Kevorkian, vice president; L. W. Janeway, secretary and treasurer.

Pig Iron Production Gains

Daily Output Rate Indicates Increase of 2698 Tons Over August —Stacks in Blast Highest Since January, 1919

REFLECTING the improved blast furnace activity of August, coke and anthracite pig iron production for September reached a total of 3,124,994 tons. Although this total is slightly lower than that of August, the September output, because of the shorter month, showed a slight betterment as revealed by the gain in average daily production. On Sept. 30, 317 stacks were in blast which was the highest number operating since January, 1919.

The total output of 3,124,994 tons for September was a loss of 20,542 tons over August. On an average daily basis, this total represented 104,166 tons and a gain of 2698 tons over the 101,468 tons of the preceding month.

Steelworks or nonmerchant stacks made 2,283,173 tons compared with 2,276,433 tons in the previous month, a gain of 6740 tons. On an average daily basis, nonmerchant iron was produced at the rate of 76,106 tons per day or 2674 tons higher than the 73,432 tons of August. Merchant iron, on the other hand, with 793,231 tons showed a loss of 30,264 tons over the 823,495 tons of August. This was at the rate of 26,441 tons per day for September, a figure but slightly less than the 26,565 tons of August.

Stack activity again showed improvement and with 317 furnaces operating on the last day of the month, made a gain of 11 stacks over August when 306 were operating. Seven merchant furnaces were blown in and five blown out, a net gain of two furnaces. Of the steelmaking furnaces, 11 were blown in and two blown out, making a net gain of nine furnaces.

MONTHLY PRODUCTION

	1920	1919	1918
January	3,012,373	3,306,279	2,403,227
February	2,884,257	2,943,347	2,318,202
March	3,375,768	3,088,023	3,209,996
April	2,752,670	2,474,374	3,273,355
May	2,991,825	2,107,729	3,451,884
June	3,046,623	2,114,028	3,316,148
Total 1st half	18,103,516	16,037,988	17,972,852
July	3,043,918	2,424,212	3,408,584
August	3,145,536	2,742,081	3,378,479
September	3,124,994	2,480,790	3,413,223
October		1,864,424	3,482,392
November		2,407,369	3,347,844
December		2,626,074	3,434,114
Total 2d half		14,544,950	20,464,636
Grand total	27,477,964	30,578,730	38,437,448

DIVISIONS OF PRODUCTION

1919	Merchant	Non-merchant	Spiegel	Ferro-manganese	Other ferro
Jan.	785,384	2,480,789	15,926	17,212	6,968
Feb.	740,863	2,169,640	6,309	21,221	5,308
March	740,921	2,315,258	6,146	20,586	5,112
April	593,655	1,856,802	2,778	16,175	4,964
May	514,002	1,574,679	4,747	10,883	3,418
June	436,359	1,647,085	13,361	9,860	7,363
July	493,505	1,909,537	7,830	10,874	2,466
Aug.	518,425	2,175,517	8,179	9,252	708
Sept.	567,608	1,891,418	4,656	17,108	...
Oct.	574,519	1,269,667	5,074	15,164	...
Nov.	625,925	1,760,754	4,500	15,464	726
Dec.	653,792	1,954,831	4,508	11,210	1,733
Total	7,274,958	23,005,983	84,014	175,009	38,766
1920					
Jan.	716,574	2,267,747	5,903	18,054	4,095
Feb.	735,707	2,215,079	11,755	18,015	3,701
March	863,167	2,474,018	15,472	19,203	3,908
April	761,331	1,958,535	6,600	18,036	8,168
May	808,751	2,140,346	10,744	21,536	10,448
June	769,236	2,233,565	8,510	26,870	8,442
July	791,440	2,209,128	6,925	28,347	8,078
Aug.	823,495	2,276,433	8,333	28,642	8,633
Sept.	793,231	2,283,173	11,849	27,697	9,044
Total	7,062,932	20,058,024	86,091	206,400	64,517

SEPTEMBER PIG IRON

States	No. of Stacks	No. in blast last day of month: Sept.	Aug.	Total tonnage made: Merchant	Nonmerchant	Totals: Sept.	Aug.
Pennsylvania	160	122	116	226,007	942,074	1,168,081	1,161,465
Ohio	79	65	64	138,573	567,073	705,646	745,779
Alabama	45	25	26	126,655	71,600	198 255	212,559
Virginia	29	10	9	33,988	.....	33.988	32,393
New York	28	23	23	82,988	145,983	228,971	233,199
New Jersey	5	2	2	9,153	.....	9,153	8,020
Illinois	25	20	19	56,920	210,615	267,585	262,060
Colorado	6	3	3				
Indiana	18	13	12	34,878	276,263	311,141	306,855
Maryland	6	6	5				
Wisconsin	6	3	3				
Kentucky	7	5	5				
West Virginia	5	5	5	48,584	45,030	93,614	94,395
Tennessee	10	8	8				
Washington	1	0	0				
Georgia	2	0	0				
Texas	1	0	0				
Minnesota	3	3	2	35,485	24,532	60,017	58,999
Michigan	3	3	3				
Missouri	1	1	1				
Spiegel and ferro—All states						48,590	45,605
Totals	434	317	306	793,231	2,283,173	3,124,994	3,145,536

Thousands at Meeting

Exhibit and Meetings at Columbus Convention of Foundrymen Attract Record Breaking Attendance

IF THE events of the first two days prove to be a fair criterion, the twenty-fifth annual convention and fifteenth annual exhibition of the American Foundrymen's association, now in session at Columbus, O., will break all records for attendance, extent of exhibits, and interest manifested in the technical program. The week of activity opened officially Monday morning at 10 o'clock when the doors were thrown open to the exhibition of foundry, machine shop and woodworking equipment. As outlined on page 1007 of this issue, this feature of the meeting includes the products of more than 235 manufacturers and occupies more than 85,000 square feet of floor space exclusive of aisles.

That more than usual interest was given the technical program is evidenced by the fact that the three sessions scheduled for Tuesday were attended by a total of approximately 1000 foundrymen. In the morning about 500 were present to hear the papers devoted to gray iron foundry practice.

"Zirconium in Cast Iron," a paper by Dr. Richard Moldenke, Watchung, N. J., proved a vehicle for an extensive discussion on cupola practice which was continued for some time in the morning session and again taken up in the afternoon. Robert E. Kinkead, Lincoln Electric Co., Cleveland, read a paper prepared by Lieut. R. F. Nourse, United States navy, describing the foundry on the U. S. S. PROMETHEUS, repair ship of the Atlantic fleet. A paper presented by George K. Elliott, Lunkenheimer Co., Cincinnati, dealt with the subject of sulphur in cast iron. In the rather extensive discussion following this paper the opinion seemed to prevail that it is not worth while in many instances to employ the electric furnace to lower the sulphur content of cupola iron. It was admitted however that in the future it probably will be necessary to use the electric furnace in conjunction with the cupola in order to utilize the high sulphur scrap which accumulated during the war.

In the afternoon simultaneous sessions on steel and nonferrous practice were held. The latter was arraged under the joint auspices of the American Foundrymen's association and the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers. The steel session, discussed the standardization of materials.

The attendance up to and including Tuesday is estimated at about 4500.

British Strike Again Deferred

Coal Miners To Ballot on Government's Proposal for Wage Increase Based on Greater Production—Markets Easier, while Unemployment Is Growing—Pig Iron Shortage Becomes More Pronounced

The Iron Trade Review Staff Cable

European Headquarters,
THE IRON TRADE REVIEW,
2-4 Caxton House, Westminster, S. W. 1

Sterling—$3.49

LONDON, Oct. 5.—The strike of the British coal miners has been postponed again, for a fortnight this time, to give the miners time to ballot on the question of accepting a proposal by the government to increase wages based on output. According to this plant the increase would amount to 1 shilling (18 cents) per shift for an annual production rate of 240,000,000 tons, and 3 shillings (54 cents) per shift for an annual rate of 246,000,000 tons. All of the European iron and steel markets generally are easier. Supplies and prices are tending downward, while unemployment is increasing.

Offerings by outside mills have forced the Welsh Tin Bar association to reduce its price from £23 10s ($82.07) to £21 ($73.29). Belgians are offering finished steel at £21, delivered at Welsh port.

The shortage of pig iron has been aggravated by the damping of 12 stacks in Sheffield, due to lack of coal. Foundry iron particularly is short of requirements.

British producers are selling ferromanganese on the continent at £50 ($174.50). Competition between continental producers is growing. Luxemburg is offering pig iron at 50 francs under Belgian prices. Makers of semi-finished steel in Lorraine are cutting their prices.

Belgian finished steel is offered at £24 10s ($85.56), delivered in the English midlands. Tin plates and sheets continue weak.

British Pig Iron Is Firm at Higher Prices

European Staff Correspondence

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation Street.

Sterling—$3.50

BIRMINGHAM, Eng., Sept. 24.—Iron and steel markets this week show a further lagging of business, due to the uncertainty with regard to the threatened strike of miners. The tendency to move with caution has been seen not only in regard to buying and selling but also in the matter of prices. Recent increases in the prices of pig iron have been maintained in all districts, but in view of the small volume of business the tendency to a further increase has met with some resistence. Smelters, however, are generally confident that when the crisis shall have passed they still will be able to dominate the situation.

The decision to permit a limited export of Cleveland pig iron has produced very little result. On the Northeast coast, as in other districts, the production especially of foundry iron has not yet equaled home requirements. There has, however, been a release for export of small quantities of mottled and white iron at the full maximum of £11 5s ($39.37). No. 3 Cleveland g.n.b., No. 4 foundry and No. 4 forge still are quoted only for home consumption at £11 5s ($39.37) per ton and No. 1 £11 17s 6d ($41.56), but export of these grades is still under a strict embargo.

There will be very little East coast hematite offered this year and all lots available for export are immediately taken. For such small parcels £14 ($49) and upwards can be obtained.

In the West coast market every ton of low phosphorus iron that can be produced goes into immediate consumption. The demand for ordinary iron is even more strong than for the special and semispecial brands. The market for all pig iron is very firm.

Under present conditions buying of finished materials is for the most part of a tentative character. There is, however, a well maintained demand for structural steel. Makers of ship and bridge plates, both in the midlands and in the North, have very heavy commitments and are being applied to in vain for new orders.

There is some prospect, it is said, of Belgium entering into the competition for heavy steel, but Belgian activity in this country is chiefly confined at present to billets, blooms, malleable iron, sheet bars and other light material, which is being offered at prices below those of British makers. There has been a cut of £1 ($3.50) recently in the nut and bolt material coming into this district from Belgium. From all markets it is reported that the cautious attitude of buyers is not due entirely to the present crisis in the labor world, but is attributable in some measure to the belief that not only Belgium, but also France and Germany are making great strides in reconstruction and may be expected to bring to bear before long an important influence on British prices.

Makers of all descriptions of finished iron in the midlands are exceedingly busy. There still is great demand for bars and skelp, the prices of which are very firm. In all departments of the finished iron trade there is a fair amount of new business on offer, and should the coal strike be averted an abundance of orders may be looked for. The mills, however, have enough work to last them for some time on existing contracts.

The Welsh iron and steel markets, during the past week, have shown a little easier tendency, due to the more favorable outlook in the mine labor situation. Sellers, however, are still keeping out of the tin plate market, as they are in arrears on contracts. For prompt plates 56 shillings ($9.82) has been accepted for a basis box.

Both in Wales and in the midlands the market for galvanized sheets continues weak. Midland mills are quoting £41 ($143.50) to £42 ($147) while in Wales the price has fallen to £1 ($3.50) lower than this. There is a little better inquiry for the heavier gages, especially from India.

Current Iron and Steel Prices of Europe

British Market

Corrected to Date by Cable

Home Market Prices. Gross Tons at Works or Furnace

SEMIFINISHED STEEL

	£ s d	$ c
Billets, soft steel	21 10 0	75.04
Sheet bars	22 10 0	78.53
Wire rods	30 0 0	104.70

FINISHED STEEL

Steel bars, England, ½ to 3 inch	30 0 0	104.70
Ship plates, England	25 10 0	89.00
Ship plates, Scotland	27 0 0	94.23
Beams, England	25 0 0	87.25
Sheets, black, 24 gage	36 0 0	125.64
Beams, Scotland	27 0 0	94.23
Sheets, galvanized, 24 gage	40 0 0	139.60
Rails, 60 lbs. and over	25 0 0	87.25
Tin plate, base box, 108 lbs.	2 14 0	6.98
Steel hoops	36 0 0	125.64

PIG IRON*

West Coast Hematite	14 15 0	51.48
Hematite, East Coast Mixed Numbers	13 0 0	45.37
Middlesborough Basic	11 15 0	41.01
Middlesborough No. 3	11 5 0	39.27
No. 3 Foundry, Derby, Leicester, Nottingham	14 10 0	50.60
No. 3 Foundry, Northamptonshire	12 15 0	44.50
No. 3 Foundry, Staffordshire	14 12 0	49.07
No. 3 Scotch Foundry	13 10 0	47.12
Ferromanganese, 80 per cent	37 0 0	129.13

COKE

Yorkshire furnace	3 5 0	11.47
Yorkshire foundry	4 5 0	14.84

French Market

Prices Last Reported

PIG IRON

	Francs per metric ton (2205 lbs.)	$
Hematite, Lorraine	855 to 915	53.87 to 57.65
Foundry, Longwy, 3 per cent Si., sand-cast	600	37.80
Foundry, Longwy, 2 per cent Si., chill-cast	650	40.95
Foundry, Longwy, 2 per cent Si., sand-cast	597	36.41
Foundry, Longwy, 2 per cent Si., chill-cast	630	39.69

COKE

French furnace	245	14.84
German, Belgium and British furnace	270	17.01

SEMIFINISHED STEEL

Blooms	975 to 979	61.30 to 61.68
Billets	973 to 979	61.30 to 61.68
Sheet bars	1223 to 1259	77.05 to 79.32

FINISHED STEEL

	Francs per 100 kilos (220 lbs.)	$
Merchant bars	145	9.14
Angles	145	9.14
Normal beams and profiles	140	8.82
*Plates bridge and tank, 5 millimeters and thicker	184½	11.62
*Sheets, black, 3 millimeters	192 to 199	12.10 to 12.54
Bars, cold-drawn, 40 to 60 millimeters round	220	13.86

Pig iron prices are f.o.b. furnace; semifinished steel prices f.o.b. works, finished steel prices, according to the schedule of the Paris Consortium of Iron and Steel dealers, delivered, except (*) which are from schedule of the Comptoir des Toles.

Belgian Market

Prices Last Reported

PIG IRON

	Francs per metric ton (2205 lbs.)	$
Foundry, 3 per cent silicon, Belgium	575	39.10
Foundry, 3 per cent silicon, Luxemburg	650	44.20
Basic, open-hearth, Belgium	575	39.10
Basic-bessemer, Belgian	570	38.76

SEMIFINISHED STEEL

Blooms	750	51.00
Billets	815	55.42
Sheet bars	850	51.80
Wire rods	1050 to 1150	71.40 to 78.20
Standard rails	1050	71.40

FINISHED MATERIAL

	Francs per 100 kilos (220 lbs.)	$
Merchant bars	100 to 105	6.80 to 7.14
Normal beams and profiles	100 to 105	6.80 to 7.14
Plates, 5 millimeters and thicker	135	9.18
Plates, 3 to 5 millimeters	150	10.20
Sheets, black, 3 millimeters	150	10.20
Plain wire	385	26.18
Sheets, galv., 3 millimeters	275	18.70

*Sold on same basis as semifinished material.
†Plus 50 francs for export.
All prices f.o.b. furnace or works, except finished material, for which delivered prices are quoted.

Belgian Buyers Wait; Prices Shaded

European Staff Correspondence

Franc—$0.073

BRUSSELS, Sept. 12.—A slight revival of labor disturbance in the past fortnight has appeared but nothing on a scale affecting production in general lines. Demands from abroad are piling up before producers of finished products, which again accentuates the fact that the Belgians are going out strong for this class of business. Semifinished products still are weak, and consumers manifestly are awaiting further price reductions. Steel casting plants are well filled with orders for weeks ahead.

Of 54 blast furnaces existing in Belgium in 1913 10 were in operation on Jan. 1, 1920 and before the first of June 5 others were brought in, with two others on the eve of being fired. Of the original 54 blast furnaces 51 had been either partly or wholly destroyed. The Belgian iron and steel output for the first half of this year is as follows:—

Pig Iron		Per cent compared 1913
January	40,820	19.7
February	51,773	25.0
March	66,009	31.9
April	75,686	36.6
May	91,842	44.4
June	100,907	49.0
Finished Iron		**Per cent of 1913**
January	15,318	60.4
February	16,858	66.5
March	14,525	57.3
April	15,527	61.2
May	17,337	68.4
June	13,913	55.0
Steel Bars		**Per cent of 1913**
January	56,006	27.2
February	70,848	34.5
March	78,985	38.4
April	100,274	48.8
May	98,985	48.2
June	112,922	55.0
Finished Steel		**Per cent of 1913**
January	67,651	43.7
February	71,250	46.5
March	90,508	58.4
April	80,667	52.1
May	81,331	52.5
June	94,894	61.0

On the basis already arrived at from monthly outputs it is anticipated that production of coal for all Belgium will within the year amount to 22,073,712 tons. This is but 772,288 tons less than the production in 1913.

Railway rolling stock manufacturers in Belgium are fighting hard to retain some of the big business in this line which has gone to Germany, but the government is influenced entirely by prices and with the favorable exchange as to the German mark it is of decided financial interest for the government to buy outside the country.

The Brussels Bourse comments on the fact that finished steel products have been commonly quoted at 100 francs ($7.30) per 100 kilos (220 pounds). It knows of no business which has been done at a lower figure, though an enormous volume is believed to be awaiting for more favorable conditions. It is possible that some specialized plants are already producing and stocking plates and profiles with this end in view. Base prices mean little in this liquid state of affairs, and though the variations may be small in each case, they indicate that shading has been necessary.

The coal and coke situation is considerably improved and may be considered stabilized. Another survey of coal consumption by the various Bel-

gian industries is now being made through government channels, the results of which will indicate the precise development which is going on in the Belgian metallurgical industries.

Belgian iron and steel exports increased from 35,748 tons, of a value of 28,997,000 francs, in January, 1920, to 77,585 tons, of a value of 100,440,000 francs, in June. The value of the machinery exported increased from 8,974,000 francs to 22,368,000 francs.

Continue German Pig Iron Syndicate

European Special Correspondence

DÜSSELDORF, Germany, Sept. 21.—The most important development in the last two weeks has been the decision to continue the pig iron syndicate in operation until the end of 1921. Prices of all iron and steel and products remain unchanged. Business is very dull.

In consequence of the scarcity of fuel quite a number of blast furnaces have been blown out. The Gelsenkirchen Union works have put seven of 20 blast furnaces out of blast. This may be due partly to a lack of suitable iron ore and the small demand in the general market.

Production of coal in the Ruhr district for the 26 working days in August was 7,500,000 tons as compared with 7,564,000 tons in July, 1920, and 6,520,000 tons in August, 1919. In 1913 production was 9,790,000 tons in July and 10,150,000 tons in August. The labor situation is calm, and no strikes of any importance are reported.

Inland ores have been reduced slightly in price, the average reduction being about 10 marks per metric ton. Foreign ores are offered freely, but in consequence of the recent fall of the mark furnaces have stopped buying foreign ores. Scrap iron is in good demand and the prices, although unchanged, are very firm.

A revival of export business is generally expected in consequence of the fall of the mark, but up to the present only an increase in inquiries, not orders, is noted. In view of the fact that at present most foreign iron and steel markets are dull, the fall of the mark is not yet sufficient to tempt foreign consumers to buy German products.

In the meantime, the authorities have given notice that the following percentages of material produced may be exported: Steel bars, 30; heavy and light bands, 35; boiler and tank plates, 25; sheets, 75; wire, 35; railway material, 60; gas and steam pipe, 50. Exportation of pig iron is prohibited entirely. Semifinished material may be exported up to 15 per cent of production.

Export prices have been fixed for various countries in the money value of the land of destination. For steel bars the following export prices have been fixed: Holland and Dutch colonies, 275 Dutch guilders; Switzerland, 560 Swiss francs; Finland and Sweden, 450 Swedish crowns; Norway, 590 Norwegian crowns; Denmark, 600 Danish crowns; Poland, 4800 German marks, all per metric ton, freight basis, Oberhausen of bessemer quality, Germany.

French Stock Output as Buying Lags

European Staff Correspondence

Franc—$0.068

PARIS, Sept. 12.—Signs of price reductions continue to multiply due to a more normal supply of coal and coke for French iron and steel plants. The situation in Lorraine is particularly encouraging in this respect, and if it were not for the actual work of reconstruction the Lorraine industry might take the lead.

The plate and sheet market is improving. Demand has increased and manufacturers are trying to meet it now that coal and coke are available. It is the heavier products of which plates and heavy castings and rolling mill products are the most sought after as a means of getting quick returns, that is in the most satisfactory state. Secondary plants and small fabricators are having difficulties in procuring supplies.

The government arsenals still are holding 60,000 tons of ship and boiler plates for which private industry has great need. The minister of marine has replied to an inquiry that the government requires to hold these plates pending decision as to what repair work or new construction is to be undertaken in government yards. Meantime, the government is paying interest on the investment, and private shipbuilders are turning down repair orders which are being sent to England and Holland.

New deposits of both coal and iron are being worked in Lorraine by an Alsatian-Lorraine company just organized with 1,000,000 francs capital. The deposits are at depths of from 90 to 150 meters.

Scrap iron prices still are high and exports are forbidden. Machine shop iron scrap is 20 francs ($1.36) per 100 kilos (220 pounds); steel turnings and borings, 16 francs ($1.16); old rails, 25 francs ($1.70); axles and tires, 35 francs ($2.34); iron or steel plate clippings in bulk, 14 francs ($1.95); compressed, 19 francs ($1.29) and old boiler plates, 26 francs ($1.76). These prices are given for the Paris region. In the country iron and steel scrap is quoted generally at an average of 10 per cent less.

The war salvage board has been selling wire netting in 10-ton lots at 700 francs ($47.60) per ton, and iron wire in a single lot of 400 tons at 1220 francs ($82.96). These prices do not include cost of transportation. They have no bearing on market prices, favorable though they are.

The great American expeditionary force camp at Is-sur-Tille is being offered in its entirety to the highest bidder above 100,000,000 francs ($6,800,000) this week. No one knows what there is hidden away there, from horseshoes to typewriters, electric motors, boiler plates and construction material of all kinds. Until this war material is all cleared up and distributed there will be no hope of the warehouse man in France stocking anything more than he has to.

The general meeting of the iron and steel comptoirs in Paris last week has not resulted in any public announcement as to price adjustment. Meanwhile, consumers are buying as little as possible, and the manufacturers are piling stock. The latter are not likely to lose anything, in view of the fact that they are seeking direct business to the exclusion of the middleman.

Safety Requires Clear Brain

National Congress at Milwaukee Hears Minds Free from Worries and Cares Are More Essential than Mechanical Safeguards—Nearly 5000 in Attendance—Combined Metals Section Is Active

THAT safety is largely the result of a state of mind rather than a result of mechanical aids is coming to be the belief of safety engineers. Throughout the sessions of all sections of the National Safety congress at Milwaukee, Sept. 27 to Oct. 1 this idea was brought to the front strongly, dwelt on and reiterated until it assumed the value of a keynote for the gathering.

In its ninth annual congress the National Safety Council returned to the city of its birth, grown many hundredfold from its comparatively feeble start, a movement which has spread to practically all departments of industry and attained a position of recognition as one of the most valuable humanitarian and efficiency campaigns of the age. That it is still growing is evidenced by the fact the registration the first day of the congress was greater than at any preceding congress and the total registration at the end of the sessions far exceeded all others. Not only were safety workers in the city but they wer at the sectional and general meetings to hear and to take part in discussions of methods and results.

Milwaukee recognized the return of the council and observed a safety week in the effort to reduce or obviate accidents for the entire period as an object lesson of the fact that care and "thinking safety" will accomplish wonders. Transportation, industry and homes were enlisted in the effort and everybody was confronted by the fact that safety is worth while and can be attained by thinking about it. As a result of the campaign the coroner reported one accidental death in Milwaukee up to midnight Thursday, compared with seven for the correponding five days in 1919.

Close to 5000 safety directors and officers from all lines of industry were present at the congress. A development of the program recognized early in the sessions is that the idea of safety must be sold to the "higher-ups" first as a foundation and then to the men, though the latter cannot be done with effect unless the support of the former comes down the line to the foremen and then is conveyed by example and precept to the men. It was said by some speakers, with more or less emphasis, that safety-thinking men do much more to promote safety than safeguarded machines and if both cannot be had safety thinking is better alone than mechanical safeguards.

The Council's Growth

Year	Membership	Employes	Budget
1913.....	40	..	$ 1,499
1914.....	731	6	15,195
1915.....	1,211	10	32,979
1916.....	2,120	14	46,131
1917.....	3,290	22	76,590
1918.....	3,606	31	118,452
1919.....	3,761	40	156,297
1920.....	4,051	44	233,413

The psychological aspect of safety is gaining such recognition that it cropped out in nearly every paper at the congress, even to the extent of recognizing that contentment and freedom from domestic worries, which distract attention and deaden perception, are factors to be taken into account in making up the score of safety. Education, defined as "selling safety," was insisted on as the one indispensable condition to success, outweighing mechanical safeguards and all other factors. How education can best be carried on for fullest results was not agreed on by all speakers and interesting discussion of various methods showed that standardization and cut-and-dried methods are not yet here and that much research for the best methods still can be undertaken profitably.

The former foundry section of the council and iron and steel section have been united in a single section as metals, the problems and aims of both being almost identical. Three sessions of this section were held and presented a number of valuable papers and discussions bearing on special problems in that branch of industry. This proved to be one of the most important sections, though railroads were largely represented and public utilities had an important place.

In the formation of the program early prominence was given to the A B C session, which, as its name indicates, was designed to give as much general information as possible for the benefit of newcomers into the council. Essentials of a plant safety organization were presented by W. E. Worth of the industrial relations department of the International Harvester Co., Chicago. He suggested seven essentials: a sincere desire on the part of the management to reduce accidents; willingness by the management to spend intelligently sufficient money to achieve results; realization by the management that constant and intelligent effort is necessary; a man supervising the work who truly believes a safer operation is possible; an organized group of superintendents, foremen and workmen all with a common aim; a definite policy and procedure adopted by management and men and closely adhered to; and unflagging enthusiasm.

With these essentials agreed to the mechanics of organization can be determined readily, he said, and committees of foremen and workmen interested solely in carrying on safety work should meet at stated intervals to discuss accidents and means of prevention.

"Plant inspection should be done by committees to determine possibility of improvement in methods of operation," he continued. "This produces many valuable suggestions. Causes for every accident should be found. If in man, educate them; if methods, correct them; if machinery, place proper safeguards. It is important that much time be de-

New Officers

President—Charles P. Tolman, chairman manufacturing committee, National Lead Co.

First vice president—W. H. Cameron, secretary, National Workmen's Compensation Service bureau, New York.

Second vice president—W. E. Worth, industrial relations department, International Harvester Co., Chicago.

Third vice president—L. A. deBlois, safety manager, E. I. duPont de Nemours & Co., Wilmington, Del.

Fourth vice president—John Oartel, director of safety, Carnegie Steel Co., Pittsburgh.

General manager—C. W. Price, Chicago.

Secretary—Sidney J. Williams, Chicago.

Assistant secretary—R. T. Solensten, Chicago.

Treasurer—W. H. Frater, Chicago.

DIRECTORS

Elected for three years

R. W. Campbell, Illinois Steel Co., Chicago; B. Dawson Hall, *The Coal Age*, New York; Alexander Brown, president, Brown Hoisting Machine Co., Cleveland; John Oartel, safety engineer Carnegie Steel Co., Pittsburgh; A. W. Koehler, Minneapolis; J. H. McClain, safety director, Procter & Gamble, Cincinnati; B. C. Ball, president, Ball-Wilmette Steel Co., Portland, Oreg.; R. P. Tell, chairman, National Brake & Electric Co., Milwaukee; Dr. R. S. Vitt, city coroner, St. Louis; H. L. Gaddis, Detroit; G. L. Avery, secretary the Avery Co., Peoria, Ill.; W. L. Chandler, assistant treasurer, Dodge Safes & Engineering Co., Mishawaka, Ind.; L. A. deBlois, E. I. duPont de Nemours & Co., Wilmington, Del.; J. M. Eaton, assistant to president, Lincoln Motor Co., Detroit; Charles R. Hook, vice president, American Rolling Mill Co., Middletown, O.; Earl B. Morgan, employment manager, Curtis Publishing Co., Philadelphia; Dr. F. D. Patterson, Pennsylvania department of labor and industry, Harrisburg, Pa.; A. D. Risteen, Travelers Insurance Co., Hartford, Conn.; L. B. Robertson, General Motors Corp., Detroit; Dr. E. B. Ross, bureau of standards, Washington; Charles B. Scott, general manager, bureau of safety, Chicago; George Albert Smith, Henry L. Doherty & Co., New York; Ida Tarbell, writer; B. F. Tillson, New Jersey Zinc Co., Franklin, N. J.; C. P. Tolman, National Lead Co., New York; E. B. Tolsted, Independence bureau, Philadelphia; W. E. Worth, industrial relations committee, International Harvester Co., Chicago; H. M. Weber, Chicago Telephone Co., Chicago; A. W. Whitney, National Workmen's Compensation Service bureau, New York.

voted to these three factors, for if they are not controlled no enthusiasm will attain definite results. Educate the foreman as the point of contact with the men, and pay particular attention to new workmen, who should be given thorough schooling in safe practices by the foreman or one of the experienced employes."

Committees Are Essential

In giving his experience in getting results from plant safety committees, T. H. McKenney, supervisor of labor and safety at the South Chicago plant of the Illinois Steel Co. and a veteran in safety work, called attention to the fact the first safety committee was organized at that plant in 1908 and that the formation of such committees was one of the most important factors in the progress of organized safety work. The organization at this plant resulted from a meeting of casualty inspectors of companies subsidiary to the United States Steel Corp. in May, 1906, the first committee on safety being formed two years later. The plan now includes:

The United States Steel Corp.'s committee of safety, consisting of seven members of the larger subsidiaries, meeting quarterly to study all serious accidents and recommend means to prevent recurrences; central safety committees made up of important officials of various subsidiary companies meeting monthly for purposes similar to the first committee; plant safety committees formed of officials of the individual plants meeting monthly, weekly or as occasion demands and with similar duties; and departmental and special committees made up of foremen, mechanics, skilled and unskilled workmen, meeting weekly or monthly according to their own plan of organization.

Mr. McKenney said approximately 20 standing departmental safety committees have been organized with a membership of approximately 120 men. The personnel of all committees is changed from time to time, some serving six months and others one year, giving all employes opportunity to serve on committees and in the course of time to develop into practical safety men. He concluded by expressing the belief that results depend entirely on the attitude of company officials which is reflected down through superintendents, foremen, subforemen and gang leaders to the workman. Therefore, he said, it is the first duty of safety organizing to obtain the undivided spirit and co-operation of the powers above or desired results will not be accomplished.

Goggles always have been one of the problems of the safety engineer, through the opposition of workers to their use. S. H. Kershaw, of the Hercules Powder Co., Wilmington, Del., speaking before the chemical section, presented some interesting sidelights on this question when he said that while need for the use of suitable protection for the eyes of workmen against injury no longer has to be shown there is a vital need for an exchange of ideas as to the best methods to employ to get men into the habit of wearing goggles and other forms of eye protectors.

In the metals section R. C. Salisbury, supervisor of safety for the Interstate Iron & Steel Co., Chicago, outlined the plan followed in his work, an organization which has given much success, declaring organization is of prime importance. From this center education and safeguarding emanate, he said. The ideal method must include employes as well as officers and the various units have highly specialized functions, while co-operation between various units is essential and one unit must have the function of a court of review to make final decision in matters of dispute.

Mr. Salisbury said accurate accident records are essential and only in this way can the safety department justify its existence, comparative records showing its effectiveness, and cost records are also necessary, to indicate the expense of safety work and comparisons with other periods, with reasons for increases or decreases.

Must Heed Personal Element

With the effect of the personal equation much to the fore in all sessions, Frank Moffett, engineer for the National Malleable Castings Co., Cleveland, enlarged on this theme to greater extent than others, giving it great weight in seeking causes for accidents and in taking measures to prevent them. Mr. Moffett said the personal element enters into safety just as it enters into the quality and general appearance of the commodity being produced by labor. The speaker related how investigations of the industrial commission of the United States show that to a very great extent, the blame for accidents cannot be laid to either the employer or the employe, as accidents are a natural outcome of production. In many cases there is blame, he said, especially when the best safety appliances are not provided, but the establishment of the blame does not bring with it a remedy for the economic incapacity of the individual wage earner.

Looking at this subject from the standpoint of construction and design Nicholas Prakken, of the Pawling & Harnischfeger Co., Milwaukee, discussed the features of the electric traveling crane, outlining the methods for safeguarding crane operation now being used by builders, thereby meeting the present demand for safety devices being designed and built in rather than added afterward. While cranes and hoists vary in accordance with the sort of service demanded, the speaker confined his observations to types used in foundries, machine shops, yards, shipways, etc.

Debate Value of Prizes

Blast furnace operation always has been subject to many peculiar hazards, some of which have been intensified by modern developments of practice, requiring special methods to guard against injury and death to workers. South Works of the Illinois Steel Co., Chicago, has developed a highly efficient plan which was described by L. A. Touzalin, assistant superintendent of blast furnaces at that plant. His description is printed in full beginning on page 987 of this issue of THE IRON TRADE REVIEW.

A point much discussed and never definitely decided, perhaps because adherence to either plan brings much success,. is the use or non-use of prizes and bonuses in safety work. As a feature of the metals section a debate was put on in which the experience and arguments of each claim were set forth by speakers of experience in the respective plans. J. C. Smith of the Inland Steel Co., Chicago, argued for the bonus system which has proved of value to his company, while the negative was upheld by Philip Stremmel of the National Enameling & Stamping Co., Granite City, Ill.

Mr. Smith believes the spirit of competition to win a prize or other recognition of accomplishment and the possession of it after winning form strong incentives to think safety and practice it.

No rewards or premiums should be given for safety work, as it has a tendency to make men more interested in prizes than in promoting safety and cheapens the cause of safety in the minds of those whom it is desired to reach by holding up prizes rather than the thought of safety, declared Mr. Stremmel. As a safety first movement necessitates education, the result will depend largely on the spirit and motive, rather than obtaining a fob, knife or other reward, he said.

At several points in the various discussions the point was made that worry over himself or his family and their social relations tends to dull perception in the workman and subject him to greater danger from accident. In the Northern mining communities, with a preponderant foreign population, this is especially true and mining companies have found the industrial nurse a strong aid in removing much of this feeling, according to

George Martinson, safety inspector for Pickands, Mather & Co., Gilbert, Minn., who told of the value set on services of the nurse.

Exhibits by safety garment makers, manufacturers of machinery guards, fireproofing, and various other lines making for industrial and public safety were shown in machinery hall, which was well filled with booths housing the developments looking to greater safety in general. The historical exhibit of the National Safety Council on one wall of machinery hall, a series of nine panels, one for each year of its existence, probably was the most interesting feature of this department.

At the annual banquet Thursday night, addresses centered around the fact that the birthplace of the National Safety Council is Milwaukee, where in 1912 as an outgrowth of meetings on safety by the Iron and Steel Electrical Engineers society, an industrial safety congress was formed.

R. W. Campbell, chairman of the central safety committee of the Illinois Steel Co., Chicago, gave reminiscences, sketching the factors which gave original impetus to the movement, and the ideals of its founders which have been so largely realized. H. Walter Forster of Independence Associates, Philadelphia, made a witty address on "Impressions," into which he sandwiched much seroius discussion.

At the banquet Maj. H. F. Doidge, leader of the delegation of three from the British Industrial Safety First association, presented a letter of greeting from Lord Leverhulme of London, its president. The National Safety council by rising vote ordered a message of thanks to be returned to the British association.

Electrochemists Study Furnace Losses

FAVORABLE action on the adoption of the metric system in this country was announced at the thirty-eighth general meeting of the American Electrochemical society at its three-day convention at the Statler hotel, Cleveland, Sept. 30-Oct. 2. Over 250 members and guests attended the meeting. A referendum vote held recently showed a large majority in favor of metric measurement, the ballot being 483 in favor of the resolution and 107 in opposition. However, less than one-fourth of the total membership returned the ballots. The convention program consisted of three morning sessions devoted to technical papers with the afternoons devoted to numerous inspection trips to manufacturing plants in the vicinity.

Thursday morning's session was called to order by Walter S. Landis, American Cyananide Co., New York, president of the society, who introduced as a speaker, W. E. Davis, Cleveland commissioner of light and heat. Mr. Davis on behalf of Mayor FitzGerald welcomed the society to the city. Following the brief reply of the chairman, the meeting was turned over to the reading and discussion of technical papers.

The first paper, "Heat Losses Through Electrodes of a 6-Ton Heroult Furnace," by M. R. Wolfe and V. deWysocki, candidates for the degree of electrometallurgist, Lehigh university, S. Bethlehem, Pa., was reviewed by the secretary, Joseph W. Richards, professor of metallurgy, Lehigh university. Results of the test, which was made under actual operating conditions, showed that a small amount of heat was radiated from the electrode between the upper and lower cooling bands but was negligibly small in comparison with the heat carried off by the cooling water.

"Heat Content of Steel and Slag from an Electric Furnace" was discussed in a paper prepared by A. M. Kuhlmann and A. D. Spillman, candidates for the degree of metallurgist, Lehigh university and read by Dr. Richards. In discussion it was suggested that to avoid the absorption of latent heat when hot metal is poured into water for calorific determinations, the metal be poured first into solid lead and then into water.

Electrical resistivity of refractory brick at high temperatures was discussed by M. L. Hartmann, director research laboratory, the Carborundum Co., Niagara Falls, N. Y., in a paper, "Physical Characteristics of Specialized Refractories," prepared by himself with the assistance of A. P. Sullivan and D. E. Allen, research chemists, the Carborundum Co. The results showed the resistance to fall rapidly with temperature increase.

Electrode Cost Is Low

Dr. Richards presented a brief paper, "The Soderberg Electrode: First American Installation," showing that in 28 days of operation in August, only 13 minutes shut down was caused by electrode trouble. Per kilowatt-hour, the consumption of carbon was 14.2 pounds at a cost of $0.0412 per pound. As the last paper on the morning program, "Some Phenomena Observed in Electric Furnace Arcs," was discussed in an interesting paper prepared by J. Kelleher, research assistant, applied science and engineering, University of Toronto, Toronto, Ont. On Thursday afternoon inspection trips were made to the National Malleable Castings Co., U. S. Electro Lead Plating Co., Guide Motor Lamp Co., and U. S Copper Products Co.

The Friday morning session, which was held in the physics lecture room of Case School of Applied Science, was opened by President Landis as chairman, who announced that the first part of the time would be used as a business session. In reporting the action of the board of directors on the preceding evening, it was announced that the spring meeting would be held at Atlantic City or in event suitable arrangements could not be made there, at Hot Springs, Va. No date was named. A resolution was proposed to amend the constitution so that 50 members would constitute a quorum in place of 10 per cent of the membership as is now required. The amendment will be handled by referendum vote later. A brief informal discussion was held as to the attitude of the society becoming affiliated with the Federated American Engineering societies but no action was taken.

Following the business session, the meeting was turned over to the discussion of technical papers on electrochemical problems. At the conclusion of the session, D. C. Miller, professor of physics, Case School of Applied Science, gave an illustrated lecture on sound phenomena, dealing particularly with the relation of explosions to shell shock and the results obtained from a series of experiments conducted at Sandy Hook during the war. At the conclusion of the lecture the members took lunch in the gymnasium of Western Reserve university and from there took special cars to Nela Park laboratories of the General Electric Co., for an all afternoon inspection.

Saturday morning's program which was held in the ball room of the Statler hotel with President Landis presiding was devoted to papers dealing with electroplating and the influences of various alloys on corrosion. In the afternoon inspection trips were made to the Western Reserve Chemical Co., Ohio Chemical Co., and Hazelett Storage Battery Co.

British Institute Warns Labor

Steelmakers Meet in South Wales, Despite Industrial Disturbances in That Section—Interesting Papers Presented at First Fall Session in Seven Years—500 Attend and Visit Neighboring Plants

European Staff Correspondence

HELD under the threatening cloud of momentous industrial disturbances, the keynote of the fall meeting of the British Iron and Steel institute, which took place in the heart of the South Wales coal and iron district, Sept. 21-24, was the determination of the British people to maintain their established form of government, their orderly freedom, and to call a halt, even at the cost of sacrifice, to the drift of the times toward industrial revolution, anarchy and labor-union tyranny. Under the stress of war it was necessary for Great Britain to make great concessions to labor, with the result that union leaders have gone so far in some cases as to consider usurping the functions of government. But evidently the day of reckoning is at hand. In the words of Frederick Mills, chairman of the Ebbw Vale Steel, Iron & Coal Co., at a complimentary luncheon at the company's works on Thursday, Sept. 22, "Labor, beware."

It was the first autumn meeting since September, 1913, and was attended by over 500 members and guests from all parts of the United Kingdom, including representatives from the United States, Japan, France, Belgium and other allied countries on the continent.

The headquarters were at Cardiff, the great South Wales coal-shipping port. A program of technical papers was presented at two professional sessions held in the rooms of the South Wales Institute of Engineers on Tuesday and Wednesday, Sept. 21 and 22. The professional sessions, however, were more or less subordinated to the elaborate arrangements for plant inspection and the series of complimentary luncheons, teas, receptions and dances arranged by the local reception committee headed by the Earl of Plymouth, lord lieutenant of the county of Glamorgan.

The plant inspections included visits to the Dowlais blast furnaces and steel mills of Guest, Keen & Nettlefolds, Ltd., at Cardiff; the iron ore, coal and general cargo handling port at Newport operated by the Alexandra Docks & Railway Co.; the Barry Docks of the Barry Railway Co., at Barry; the new tin plate mills of Messrs. Lysaught near Cardiff; the shipyards of the Monmouth Shipbuilding Co., at Chepstow; the new Port Talbot and Margam steel plants of Baldwins Ltd.; the Swansea sheet and tin plate works; and the extensive coal mines, blast furnaces, steel works and rolling mills of the Ebbw Vale Steel, Iron & Coal Co., at Ebbw Vale.

The entertainment functions included a reception by the Lord Mayor of Cardiff, a ball at the city hall, a Welsh concert and a series of complimentary luncheons and teas, given by the Monmouthshire and South Wales Coal Owners association; Guest, Keen & Nettlefolds, Ltd.; Baldwins Ltd.; Ebbw Vale Steel, Iron & Coal Co.; and other companies whose plants were inspected.

Technical Sessions Were Interesting

WALTER DIXON, electrical engineer, Glasgow, opened the technical proceedings on Tuesday, Sept. 21, with a paper on "The Electrification of the Works and Collieries of the Ebbw Vale Steel, Iron & Coal Co." He thoroughly described this unusually extensive project.

The paper by Dr. Walter Rosenhain and D. Hanson on "Inter Crystaline Fractures in Mild Steel," was briefly discussed. E. H. Saniter, Steel, Peech & Tozer, Ltd., Sheffield, questioned whether the temperature at which the steel had been worked and also the possible effect of corrosion had been duly considered. C. H. Ridsdale engineer, Middlesborough, pointed out how many fractures he had examined were in steel which had been considerably annealed or rather over-annealed. It is rather common, he said, for billets to crack after cold shearing. In such cases the crack invariably goes through the mass of the crystal. Dr. W. H. Hatfield, metallurgist, Sheffield, said he was inclined to agree with Mr. Saniter that temperature and corrosion play some part in fractures. Failure, he said, may take place through long continued stresses well below what is understood to be the elastic range of the material. He also claimed that an increase in the phosphorous content increases the tendency to failure. Harry Brown, Bayley's Steel Works Ltd., Sheffield, said that in a number of under-annealed steels he had examined, the fractures invariably ran around the crystals. In ingots it is possible to find numerous minute cracks which almost invariably run around the primary crystals. Under stresses, these incompletely welded cavities open out on the outlines of the primary crystals. The president, Dr. J. E. Stead, metallurgist and engineer, Middlesborough, said that long before Dr. Rosenhain undertook these investigations he had found exactly the same thing in soft steel, namely, cracks divided into two different varieties, one running around the grains or crystals and the other through them. When you take a piece of steel partially fractured and subject it to sudden pressure, he said, the fracture does not continue to go around the old crack but passes through it.

The next paper read was prepared jointly by Daniel Hanson, National Physical Laboratory, Teddington, near London, and his wife, Mrs. Hilda E. Hanson. The paper was read by Mrs. Hanson, she being the first woman to read a paper before the British Iron and Steel institute. The paper is entitled, "The Constitution of Nickel-Iron Alloys." In reply to a question by Dr. W. H. Hatfield, metallurgist, Sheffield, Mr. Hanson said the specimens were heated in vacuo at 1000 degrees Cent. which should make it as nitrogen free as any metal possibly could be.

The liveliest discussion during the meeting developed at the second day's session. Several leading blast furnacemen took part. Dr. J. E. Stead, president, was again in the chair. Alfred Hutchinson, general manager, Skinningrove Iron works, Middlesborough, read his paper on "Rough-cleaning of Blast Furnace Gas by the

Lodge Electrostatic Process," and incidentally mentioned that the paper was the result of teamwork, the whole of the technical staff having contributed parts. This paper will be published in THE IRON TRADE REVIEW. Professor Henry Louis, Newcastle-on-Tyne, said he had seen the Cottrell system in apparently successful operation at Moss Bay Works, Cumberland, and inquired as to the precise difference between the two system. A. K. Reece, general manager, Dowlais plant, Guest, Keen & Nettlefolds, Ltd., Cardiff, Wales, said he considered it a disadvantage to have to constantly regulate the flow of gas to prevent a portion of it passing through untreated. Dr. F. W. Harbord, metallurgist, 16 Victoria street, London, S.W.1, called the attention to the mattress process of filtration through steel wool which he said gives very good results in the United States. The author of the paper in a brief reply said the Lodge and the Cottrell systems are essentially the same in principle though there are slight differences in detail. An important feature of the Lodge system is the method of producing uni-directional current without danger of short circuits through platinum points. The danger of a gas rush past the electrodes is prevented by the employment of 16 chambers of which 14 are kept in continuous operation. He said the success of this apparatus is due largely to the pains taken to get the gas chambers of the right shape and to the baffle-plates which are so arranged that the whole of the gas comes into contact with the electrical apparatus. The apparatus at Skinningrove handles 3,000,000 cubic feet of gas per hour. Two electricians are in charge for each 8-hour shift; two cleaners deal the gas chambers, and the manual labor is done by men employed on other work.

Dry Blast Defended

The next paper entitled, "Variations in the Heat Supplied to the Blast Furnace and Their Effect on the Fuel Consumption," was presented by W. W. Hollings, Brymbo Steel Co., Brymbo, near Wrexham, England. In this paper the author attempts to explain why the actual fuel economy resulting from some important addition of heat to the blast furnace, such as the introduction of hot blast, frequently exceeds the theoretical maximum.

The discussion, however, turned on the merits of the Gayley dry-blast. A. K. Reece, general manager, Dowlais works, Guest, Keen & Nettlefolds, defended the dry blast and pointed out its advantages to the furnaces working in the damp English climate. Theoretical expectations he remarked are very seldom realized in blast furnace practice. He said he has been using the dry blast for the past 10 years and has no desire to go back to natural air. With dry blast his furnaces carry a larger burden, the increase being 225 pounds of ore per charge. A high blast temperature also is possible when using the dry blast without introducing irregular working. The blast temperature in the Dowlais furnaces runs up to 1500 degrees Fahr. The result, he said, is less liability to hanging and sticking in the furnace than with natural air. He also said a better grade of iron is realized when the furnace goes off; with dry blast the sulphur can be kept down to 0.06 per cent instead of running up to 0.10 or 0.15 per cent as it usually does on an off-cast.

W. J. Foster, general manager, Messrs. Bradley, Dorlaston, Staffordshire, said he thought the dry blast plants so far built in England are expensive luxuries. They are no doubt excellent, he said, for those who can afford them. The ideal solution of the problem, he claimed, is to decompose the water molecules into hydrogen and oxygen. William Moore, blast furnace manager, Wolverhampton, said he had in his experience found a great advantage from the use of the dry blast. J. H. Hollings, Brymbo Steel Works, Brymbo, said the good results described by the author were largely due to the fact that he worked a one-furnace plant, which is more regular than a battery of stacks. He said he has had more trouble with dry than with natural air. It was nearly 20 years he pointed out since Gayley's system came out and yet there are only a few dry-blast plants in operation in the world.

The other papers on the program included the following: "Economic Selection of Coal," by A. L. Booth; "Notes as to Rates of Reaction in Certain Steels at 930 degrees Cent." by E. D. Campbell and B. A. Soule; "Electric Steels," by C. G. Carlisle; "Temper Brittleness of Nickel-Chromium Steels," by R. H. Greaves and J. J. A. Jones; "Graphitization in Iron-Carbon Alloys," by J. Honda and T. Murakami; "On the Formation of Spheroidal Cementite," by K. Honda and S. Saito; "The Rough Cleaning of Blast Furnace Gas at Skinningrove by the Lodge Electrostatic Process," by A. Hutchinson and E. Bury; "Indian Iron Making at Mirjati, Chota Nagpur," by A. McWilliam; "An Investigation of Various Forging Operations Carried Out Under Hydraulic Presses," by E. Schneider, and "Experiments on the Deoxidation of Steel With Hydrogen," by J. H. Whiteley.

At the various luncheons and other functions the speakers were led almost inevitably to consider the labor situation, although the Iron and Steel institute is primarily a technical society. The central theme of these discussions was voiced by Frederick Mills in the two words already quoted. Another strong speech was made by Sir Leonard Llewelyn a prominent mine owner who said that the time has come to take a firm position with reference to the disrupting elements in British society. "If we haven't the courage to face the facts in the labor situation as they are, to insist on justice, and to resist class tyranny, then we jolly well deserve to go under," he declared.

One-third Mile Long

The various plant inspections were exceedingly interesting from a technical standpoint. At the Dowlais works, the reheating furnaces between the slabbing and plate mills are arranged around the circumference of a circle about 90 feet in diameter and are served by a hydraulic pivot crane which charges and removes the slabs. The runout table of the slabbing mill and approach table of the plate mill are placed at the opposite ends of one of the diameters of this circle.

At the works of Messrs. Lysaught there are 44 black plate mills in a single line, the mill building being a third of a mile long. The furnaces are all operated under strict pyrometric control, a series of recording instruments being grouped in a centrally located pyrometer house which is connected by telephone with each furnace. By means of the telephone, the heater is promptly advised of any unusual variation in temperature of his furnace.

At the Ebbw Vale plant, the visitors were specially impressed by the extremely up-to-date blast furnace which has recently been completed. These stacks, working on a leaner ore mixture than is customary in the United States, turn out 450 tons a day. At the new Koppers coke ovens at Ebbw Vale, the coal is obtained from mines which are almost adjacent. The coke, which is quenched as it is pushed out of the ovens, slides across an inclined wharf into buckets operated by an overhead cableway. This cableway conveys the coke direct to the skip-hoist hoppers. A considerable proportion of the blast-furnace fuel is not handled by rail at all. The coal mines are electrically equipped including the winding gear which is driven by 2200-volt 3-phase induction motors. The foregoing sketches merely a few of the exceedingly interesting technical features which were examined by members of the institute and their guests during the meeting.

Reducing Blast Furnace Hazards

Safety Thinking, Coupled With the Employment of Improved Safety Devices, Lessens the Danger Lurking in Blast Furnace Gases, Hot Metal and Cinder, and Mechanical Apparatus—Drills and Instruction Important

BY L. A. TOUZALIN

DESCRIPTION of safe practices in blast furnace operations from an operating man's standpoint includes the consideration of safety devices and the best methods of promoting safety thinking. When the "safety first" slogan was first seriously taken up by the industries of the country, it was perfectly natural that the installation of safety devices should receive first attention. For several years such installations could not be carried on fast enough to meet the needs of the hour. In fact, the average operator's first definition of a safety inspector would probably be "a pestiferous individual whose business it was to hound the operating departments with the everlasting question: "When is the installation of a safety device going to be completed?"

Comparatively little attention was paid to the study of the best methods for promoting "safety thinking." Prizes, buttons, bonuses, etc., were awarded to those who proposed the best safety devices to overcome well known serious mechanical hazards.

Gradually as such safety devices came into more common use it became noticeable that while the diminution of accidents was very gratifying, it was, nevertheless, not in proportion to the installation of such equipment. It was then first realized that the concentration of effort in developing devices had possibly overshadowed and neglected to a certain extent the practice of teaching workmen to *think* safety. Developments during the last few years have made it more and more apparent that the greatest weapon for cutting down accidents is the instilling of safety thinking in the minds of the workmen. The writer believes the majority of blast furnace superintendents would prefer to operate a plant having a well trained safety thinking organization than a plant containing most of the up-to-the-minute safety devices known, with an organization indifferent to safety thoughtfulness.

The consideration of safe practices around blast furnaces naturally hinges on blast furnace hazards; for the greater the hazard the more intense should be the application of safety methods. If time permitted, it would be interesting to start at the docks, proceed through the stock house to the furnace tops, from the tops to the cast house, and from there to the pig machine, ladle house, etc., and trace the gradual development of safety practices and equipment to overcome hazards encountered at these points.

Gas is Most Serious

All blast furnace men will undoubtedly agree that the most serious hazard in connection with the operation of iron blast furnaces is the handling of blast furnace gas. While it is true that the improvements made in blast furnace construction and operating during the last 10 years have largely reduced the necessity for workmen to come into contact with furnace gases, these very improvements, to a certain extent, have made the gas more treacherous and dangerous to the operating crew should they come into contact with it. In the days of hand filling, the top fillers were apt to consider a gas headache as a normal condition under which their work was to be done. The men were wont to boast as to their ability to "eat the gas."

These men were brought down from the tops and scattered along the cast house gangs by the replacement of hand filling by the automatic skip hoist. Shortly after this new development, the use of washers for cleaning the gas was inaugurated, and when these same "gas eaters" encountered their old friend in a cold, wet and clean condition, they received a severe shock. They suddenly discovered that their former boast of "knowing when they had enough gas" was no longer applicable. They had simply to take a whiff or two and instantly they were out of business. They failed to realize that the gas, which had formerly been fairly invisible, hot and light enough to rise and diffuse rapidly, after being washed had become practically invisible and odorless, and of such lower temperature and greater density that its presence was not apparent until it had made itself evident by its sudden effects. There was a period when several serious gas accidents were required to convince these old timers that a change had occurred in the properties of blast furnace gas. It did not take long, however, to demonstrate to all concerned that the only safe way to treat washed blast furnace gas is to stay away from it.

One of the greatest gas hazards is the seepage of gas through furnace walls, foundations and surroundings whenever a banked furnace resumes operation. At such times gaseous areas will accumulate in most unexpected places, and too much emphasis cannot be laid on the importance of the most rigid watchfulness at this time. At the South works of the Illinois Steel Co., the experience during the past two years of alternate banking and "blowing up" has resulted in the following method of procedure under such conditions. Just before blowing up, two or three practice men are sent out to gather the men into groups and to explain that the furnace in question is about to resume operation. Each man is instructed to watch his fellow workmen. The blower assigns a partner to each man whose presence somewhat near the furnace is necessary, and these men are instructed to watch each other for any symptoms of the effects of gas. Patrols, in pairs, are placed at safe distances from the furnace and at locations as to enable them to see and prevent anyone approaching the furnace from any direction.

Many accidents have resulted, and many lives have been lost by men working in a furnace or in its gas equipment when such furnace was out of blast and disconnected from other furnaces by a water seal only. In unaccountable ways the water has been lost at the seal or violent slips on other furnaces have blown enough gas through the seal to cause serious trouble. The only positive means of preventing such accidents in the iron clad law prohibiting any individual or group of men, under ordinary operating conditions, from working at any location in a furnace, dust catcher, washer, dryer, water seal, or any part of the furnace equipment where he is protected solely by a water seal. When such work is to be done the furnace in question should be protected by a plate or goggle valve. This positive

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From a paper presented at the Milwaukee meeting of the National Safety Council, Sept. 27-Oct. 1. The author, L. A. Touzalin, is assistant superintendent of blast furnaces, South works, Illinois Steel Co., Chicago.

means of protection becomes very simple if water seals with adjacent flanges for plate valves are installed just beyond the dust catcher and just before the clean gas main. At South works, each of the 11 furnaces is now so equipped and it is possible to shut off any individual furnace by first filling a water seal and then turning a goggle valve or inserting a plate on the dead side of this seal. Under extraordinary conditions, occasions may arise when it is necessary to send a man into a place protected by a water seal only, but in such cases the man doing the work should either wear a gas helmet or where impossible to enter so equipped, should have a life line securely tied about himself, and extended to a safe location outside the manhole.

The ordinary manhole provided in dust catchers, washers, gas mains, etc., is of such size that a man under normal conditions can just about squeeze through. It is an exceedingly difficult task to get a man through the hole if he is in a partial or completely unconscious condition. In all future construction manholes should be made large enough to freely admit a man fully equipped with a gas helmet apparatus.

Provision is made on all of the South works furnaces for inserting a goggle or plate valve in the main when a furnace is to be relined, banked or down for repairs. In some cases, however, the necessity might arise for repairs to be made at some point in the gas mains where such provision cannot be made. In such a case, when men are working behind a water seal only, it is the practice to have the water seal carefully inspected regularly, the inlet and overflow outlet water valves locked with safety locks, and the bottom discharge valve securely blocked or locked. It is believed these precautions carefully followed will adequately protect men while working in such locations. Where provision is made, it is the practice to insert the goggle valve or plate when men are going in a main, and to have the water seal also full as an extra precaution.

Should Have Gas Masks

From a safety as well as an operating standpoint every blast furnace plant should have an up-to-date, self-contained, breathing apparatus equipment, but it must be borne in mind that the most efficient gas helmets made are only safe when they receive constant attention in keeping up the equipment and when worn by men who have been thoroughly trained until they feel absolutely familiar with the apparatus. One man should have the sole duty of keeping the gas helmets in first class usable condition at all times, and to take charge of training the helmet squads. The South works breathing apparatus is housed in wooden cabinets with glass panel doors. These cabinets are of sufficient size to allow each set of apparatus to be hung at the height of a man's shoulders. They were designed with two purposes in view: First, to make the apparatus accessible and ready for instant use or inspection, and second, to protect the apparatus from dust. The apparatus is hung completely assembled with the exception of potash cartridges, which are kept on a shelf immediately above the helmet. When a man desires to use a helmet for relief or emergency work, he inserts a new potash cartridge and, after putting on the apparatus, tests it thoroughly for leaks. If he desires to put on the helmet for practice work only, he uses a potash cartridge which has been previously used for this purpose, and is sealed with rubber stoppers. The helmet man systematically inspects each helmet once a week. If the helmet is in first class working condition he attaches a seal, and should this seal be found broken at any time it is an indication that the helmet has been in use since his last inspection. A written report is filled out after each inspection and a copy submitted to the assistant superintendent in charge of that particular department.

Before the world war it was difficult to instill confidence of the workmen in gas helmets, but the trench helmets used for gases other than carbon monoxide received so much publicity in our newspaper during the war that men have lost their fear of them to a great extent. Each of the South works departments has a helmet squad consisting of men who have been examined by the company physician and thoroughly trained in the use of the equipment by the helmet man. This squad is made up of day and night men and at least three are always on the job on either day or night turn at each group of furnaces. A siren whistle is blown in case of any gas emergency and all helmet men immediately proceed to the nearest helmet station and prepare to enter the gaseous area. Drills are frequently held, and several times during the past year certain men in the relief squad have been told to hurry to the office, get on a helmet and rescue a man from the bustle pipe of a furnace. When the relief man arrives at the bustle pipe he finds the foreman lying down beside a bag of sand. The foreman then directs him to lower the bag carefully to the ground. The best record made so far is a total of 5½ minutes from the time the man started to the office for his helmet until the bag of sand touched the ground below the bustle pipe. The furnace in question was located about 500 feet from the office.

One of the most recent developments in appliances to assist in overcoming the hazards of blast furnace gas is the appearance of a new carbon monoxide detector. It may be stated that should this instrument be found practical and positive, it will fill a long felt want in blast furnace practice.

Hot Metal Comes Next

Considering the next serious hazard after gas, we come to hot metal and cinder burns. Here again emphasis must be laid on the importance of safety thinking. And a safety thinking workman thinks for the other fellow as well as for himself. The best evidence of safety thoughtfulness in an organization is the care and advice which older furnace men bestow on new employes in regard to safety precautions. In these days of great labor turnover this lack of watchfulness of the older men over the less experienced may be the cause of many accidents.

Several devices have been brought into use during the past few years to counteract the hazard of burns around blast furnaces. Among the most important of these may be mentioned cinder notch stoppers, automatic mud guns and tapping machines. At South works a cinder notch stopper is being installed on the furnaces as they are relined, and the experience with this device so far promises good results. Like all new equipment, it will require months of use to obtain the confidence and appreciation of the men. Insistence is often required to establish the routine use of a safety device, which, once established, is henceforth an absolute necessity. Two devices which have recently been put into use in the plant and which tend to cut down burns from splashing and sparking at iron notch are a chain screen which is lowered in front of the hole at the end of the cast and through which the mud gun muzzle is inserted to stop the hole, and a splasher plate which is raised above the trough, and swung away from the hole at the end of the cast, by one man, operating a hand wheel, at a safe distance from the furnace.

The keeper, first helper and cinder snapper of each furnace are required to wear safety leggings whenever the iron or cinder is running, that is, at flushes or casts. These leggings, as originally purchased on the market were unsatisfactory, but with some few changes to make them lighter and more flexible are now well thought of

and freely used by the furnace men. Wire masks are sometimes used by the keepers when they close up the hole. These do not impede the vision and are preferred by the men over goggles. Two other devices which tend to cut down burns in the cast houses may be touched upon. One is the arrangement of sheaves and cables which are used to pull all shutters from a safe distance, thus making it possible for the man doing this to keep out of range of sparks or shots of iron. The other is the heavy cast iron bridges which are conveniently located at several points along the iron and cinder runners. These bridges make it possible to cross the runner without danger of stepping or falling into the stream of molten metal or cinder.

Taking up next the mechanical hazards, the skip hoist undoubtedly stands first as the source of accidents. It is true that the use of safety locks, rigidly enforced, has done much to overcome the great element of danger due to the possibilities of men being run over, crushed or caught by moving parts, but in spite of this safeguard, near accidents have demonstrated the necessity of some method of quick control to check the movement of the skips, should a man be found to be in danger. In order to take care of this condition some plants have installed safety switches, readily accessible to anyone standing at the side of the skip pit, so that by simply throwing a switch the power is cut off and brakes automatically applied to the hoisting machinery. At some furnaces skip inclines are covered, on the bottom and sides, with steel plates to prevent injury to those below from falling material.

Owing to the compact construction of stock houses, serious collisions have occurred between scale cars where one car happened to be stationary under breakdown repairs, and the other operating. Men working under the stationary car have been injured from the resulting shock. In order to prevent such occurrences, the stock houses at South works are provided with suitable skids which are placed on the rails at a safe distance from each end of a car under repairs to protect it.

The usual form of snorting valve used to by-pass the cold blast into the atmosphere, when it is desired to take the wind off the furnace, and the blow-off valves, which are operated to release the pressure from stoves taken off the furnace and put on gas, have given blast furnace plants the reputation of being the greatest noise producers in steel mills. It is safe to predict that within the next few years blast furnace plants will be operating as silently as any other department of the mills. Patent blow-off valves are now on the market which permit the discharge of air from three-pass stoves to be directed into the stacks. The muffling of two and four-pass stoves is easily accomplished by connecting the blow-off valve directly to the draft flue. The snort valve may be muffled in the same way; that is, by connecting the outlet to the draft flue. Both of these plans are at present in use at South Chicago, where it is believed the elimination of these violent noises is conducive to greater safety to the operating force, not to mention the prevention of partial or complete deafness to the men whose duty it is to operate these valves.

These items are the most important of a vast number of improvements and safety practices, or devices, which have been brought forward during the last decade. Statistics show the wonderful results of the continuous efforts being made to safeguard human lives in this field of industry, and there is no reason why this progress should not continue until blast furnace accidents closely approach the irreducible minimum. It is certainly true that the reward, in the satisfaction that lives have been conserved and suffering greatly alleviated, is sufficient to justify the efforts required to maintain eternal vigilance in the daily routine of the manufacture of iron, the master metal.

Book Reviews

Fuel Oil in Industry, by Stephen O. Andros; cloth; 274 pages, 5¾ by 9 inches; published by the Shaw Publishing Co., and for sale by The Iron Trade Review; price $3.00, postpaid.

This book carries the reader through the complete utilization of oil as a fuel and explains the attendant principles governing the use. Chapters include subjects as follows: Principles of fuel oil combustion; physical and chemical properties; comparison with coal as fuel; distribution and storage; heating and straining, pumping, and regulating; arrangement of boiler furnaces, types of oil burners, use in steam navigation; oil burning locomotives; the manufacture of iron and steel; heat treating furnaces; use in production of electricity; use in sugar industry; use in the glass industry; connection with the ceramic industries; heating public buildings and residences; and, oil in gas making. The appendix deals with the general uses of fuel oil. Approximately 100 operations, in which this fuel is used for heating, are enumerated in alphabetical order.

Illustration of the content is provided with 107 engravings many of them occupying a full page. Tables are included on subjects such as boiler efficiency, analyses of oils, specific gravity equivalents, locomotive fuel tests, stack sizes for oil fuel etc.

Industrial Engineering, by William M. Barr; cloth; 619 pages, 6½ x 9¼ inches; published by the W. M. Barr Co., Inc., New York, and for sale by The Iron Trade Review; price $5 postpaid.

To provide useful information for managers, engineers, superintendents, designers, draftsmen and others engaged in construction work, this handbook has been prepared containing a volume of knowledge which has not been readily accessible to the public. Part I includes separate specifications relating to the chemical and physical properties of practically all of the materials entering into engineering work for the United States government, and, because of the value of this information, is useful in every department of industrial engineering.

Subdivisions of this volume are as follows: Units and standards; weights and measures; mensuration and mechanical tables; properties of some materials used in engineering; steel bars, plates, shapes, bolts, rivets; general specifications for inspection of navy department material; iron and steel castings; iron and steel forgings, carbon and high-speed steels, heat treatment; nonferrous metals and alloys; machine details, principally those relating to steam engines. Many working drawings have been included in the text matter and cover a wide range of detail.

The book has not been prepared to serve as a textbook in engineering. Designs and tables of working dimensions accompanying, therefore, are based mainly upon marine and railroad practice and the proportions given have long ago passed the experimental stage. Machine design is attempted only in its narrowest application and only some acceptable details in machine construction are presented. Steam engine details are treated thoroughly, due to the writer's long familiarity with the subject.

The extended research on automobile steels which has been carried out by the research committees of the British institution of Automobile Engineers has been brought to a conclusion. The report has been finally approved and will be issued shortly. It will contain information in regard to the physical properties of the ten standard automobile steels of which the specifications are given in British Engineering Standards association report No. 75, with colored charts showing these properties under various heat treatments as represented by the tensile, Izod, and Brinell tests.

Heat Treating Steel Electrically

Includes Normalizing, Annealing, and Quenching—Annealing Increases Softness and Ductility—Factors Affecting the Uniformity and Quality of Castings—Advantages of Electric Furnaces for Heat Treating—Automatic Control Is Recommended

BY E. F. COLLINS

THOUSANDS of tons of steel castings are produced annually for use where particularly severe conditions have to be met. In order that castings may possess the best physical properties of which the steel is capable, some form of heat treatment is usually required. High grade steel castings may be of lesser quality physically through improper, or no heat treatment at all, than a cheaper and inferior steel which has been properly heat treated. Structural changes accompanied by varying physical characteristics, due to heat treatment, are governed by definite laws, but it must be recognized that a given heat treatment cannot be applied to all steels with the same satisfactory results; yet a given treatment corresponds to each particular kind of steel, and each responds best to its own individual temperature and time cycle.

Variables Must Be Eliminated

Heat treating of steel castings embraces the individual processes of normalizing, annealing, quenching or hardening at high temperature, usually followed by drawing at a lower temperature. Knowledge of critical points and transformations is required in order to secure the highest physical properties.

Ordinarily the finer the grain the stronger the steel, and to obtain the refinement the heating and cooling cycle for the steel must be determined as narrowly as possible. It naturally follows that the operator must have facilities which eliminate so far as possible variables in carrying out the process required, if uniformity of product and full worth of the steel is to be secured. Steel is frequently normalized to put it into the best condition for subsequent heat treatments.

FIG. 1—ETCHING OF STEEL AS CAST

The process consists in heating steel to well above critical points, and cooling at the proper rate to a temperature below redness; this breaks up networks and large crystals into finer grained structures. Annealed cast steel parts may be cooled in the furnace in which they were heated or in special cooling devices separate from the furnace.

Purpose of Annealing

The purpose of annealing steel castings is to increase softness and ductility and facilitate machining operations, to eliminate existing coarseness of grain and slip bands, secure the desired combination of ductility and elasticity for resisting strains, and to relieve internal strains such as may be caused by nonuniform contraction in cooling of the casting in the mold. The temperature ranges for annealing shown in Table II are recommended by the American Society for Treating Materials. In explanation of two temperatures for the same carbon content the intention is generally to have small castings with 0.12 per cent carbon treated at 840 degrees Cent. and large castings at 925 degrees Cent. Crystalline growth and grain size depends on the length of time which steel is subjected to a temperature sufficient to induce change in structure. This time is usually longer in large castings than in small ones.

Figs. 1 to 10 show etchings, magnified 125 diameters, indicating the change of structure and its progress with time and temperature. Table I

From a paper presented at the Columbus, O., meeting of the American Foundrymen's association meeting Oct. 4-8, 1920. The author, E. F. Collins, is consulting engineer on industrial heating devices, General Electric Co., Schenectady, N. Y.

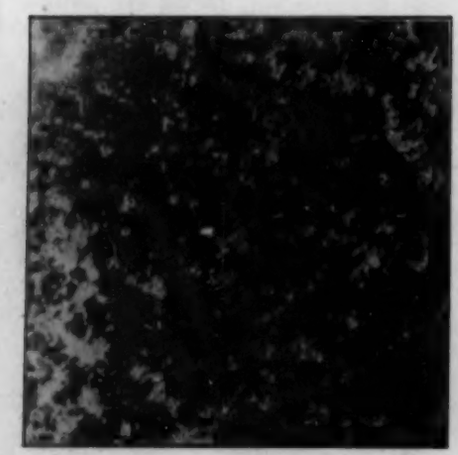


FIG. 2—ANNEALED 5 HOURS AT 825 DEGREES CENT.

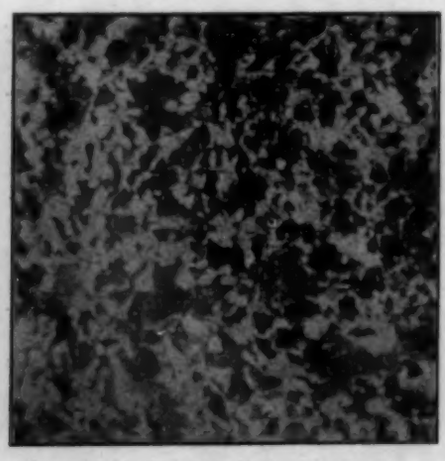


FIG. 3—ANNEALED 10 HOURS AT 825 DEGREES CENT.

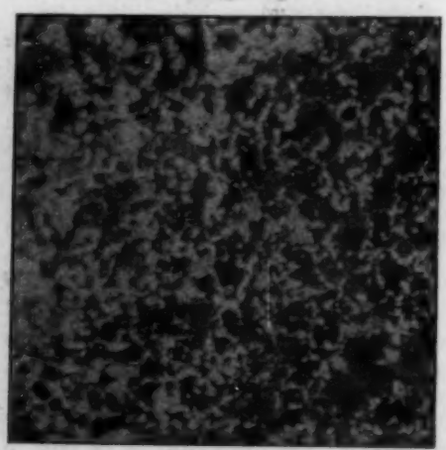


FIG. 4—ANNEALED 15 HOURS AT 825 DEGREES CENT.

Table I

Data Which Explains Figs. 1 to 10

Micro Photo	Time Annealed	Annealing Temp. Deg. Cent.	Carbon Content Per Cent	Remarks
Fig. 1	As cast		Approx. 10	Note large crystals.
Fig. 2	5 hours	825	Approx. 10	Crystals broken up cleavage slip exists.
Fig. 3	10 hours	825	Approx. 10	Structure changing cleavage slip disappearing.
Fig. 5	20 hours	825	Approx. 10	Structure changing cleavage slip disappearing.
Fig. 6	25 hours	825	Approx. 10	Structure changing cleavage slip disappearing.
Fig. 8	35 hours	825	Approx. 10	Structure satisfactory cleavage slip gone.
Fig. 9	40 hours	825	Approx. 10	Grain size and uniformity satisfactory.
Fig. 10	40 hours and 5 hours	825 950	Approx. 10	Grain size and uniformity satisfactory.

explains the microphotographs of etched steel, from a casting of large size, which was annealed to give proper grain refinement and structure uniformity. One instinctively recognizes from Figs. 1 to 10 that even Fig. 2 shows a structure that is stronger and more elastic than the untreated casting whose structure is shown in Fig. 1.

Table IV illustrates the manner in which the physical properties of a 0.30 per cent cast steel may be changed by heat treatment as follows:

1. No heat treatment, sample as taken from mold.
2. Casting normalized at temperature of 900 degrees Cent.
3. Casting annealed for five hours at 850 degrees Cent.
4. Casting annealed for five hours at 850 degrees Cent. followed by anneal for five hours at 950 degrees Cent.
5. Casting given double heat treatment, that is, first quenched in oil from 850 degrees Cent. and then drawn back at 600 degrees Cent.

These results also show conclusively that much advantage may be secured in physical properties of cast steel through heat treatment.

Factors affecting the uniformity and quality of the product resulting from heat treatment applied to steel castings:

1. Structure of cast part to be treated.
2. Carbon content and distribution in steel of phosphorus or other impurities.
3. Physical characteristics called for by specification for the part under treatment.
4. Size and shape of steel castings.
5. Furnace characteristics—design—
   (a) Furnace atmosphere—full effect.
   (b) Temperature distribution.
   (c) Rate of heating and cooling.
   (d) Capacity of furnace related to time cycle and production.
   (e) Mechanical handling of furnace charge.
      (a) Hand.
      (b) Automatic, that is, conveyor type.
   (f) Temperature control.
      (a) Hand control.
      (b) Automatic control with pyrometer.
   (g) Method of determining temperature of work.
      (a) Observation by the eye.
      (b) Optical pyrometer.
      (c) Radiation pyrometer.
      (d) Electric thermo couple and chart record.
   (h) Heat penetration and absorption.
      (a) Convected heat.
      (b) Radiant heat.
   (i) Duplication of heating cycle—heating—soaking—cooling.
   (j) Amount of scale influencing heating and cooling.
6. Human operation and control of process.
7. Cost overall.

Aside from consideration of quality and uniformity of product, the economic question of overall cost for carrying out the process is important when deciding whether or not to heat treat. Selection of equipment best suited for special or general work is equally important. Each of the foregoing factors are more or less interrelated and each plays a prominent part in the resulting quality and overall cost which may be reduced in the proportion in which the variables in the process are eliminated by automatic means or definitely controlled by the operator. Steel castings generally require different temperature and time cycles for their heat treatment than forgings. When forgings have been finished at too high a temperature they are usually coarse grained, somewhat like castings, whereas if finished at too low a temperature they may be hard and strained. This may be corrected by normalizing or annealing.

Table II

Ranges of Temperature in Annealing

Carbon Content Range Per Cent	Annealing Temperature Range Degrees Cent.	Degrees Fahr.
0.00 to 0.12	875 to 925	1607 to 1697
0.12 to 0.29	840 to 870	1544 to 1598
0.30 to 0.49	815 to 840	1499 to 1544
0.50 to 1.00	790 to 815	1454 to 1499

Structure Should Be Known

In order to determine the need for annealing or normalizing, the structure and general nature of the part should be known. This also aids in determining the proper heat treatment to give the desired physical properties. If the carbon content is widely different in pieces treated in the same charge, or is not uniformly distributed throughout the single pieces, correspondingly high and low critical points exist between which a compromise must be made in the heat requirements of the high and the low critical points. The critical temperature decreases progressively from about 900 degrees Cent. for 0.0 per cent carbon. If steel with a high carbon content be cooled rapidly, a more tender steel is obtained. Air cooling may result in some cases in giving a quenching effect to thin sections with a result similar to hardening.

When maximum softness and ductility are wanted, the best results with small pieces are produced by slow cooling in the furnace. This may not be true of large pieces, because the same rate of fall of temperature may not be sufficient to prevent over-

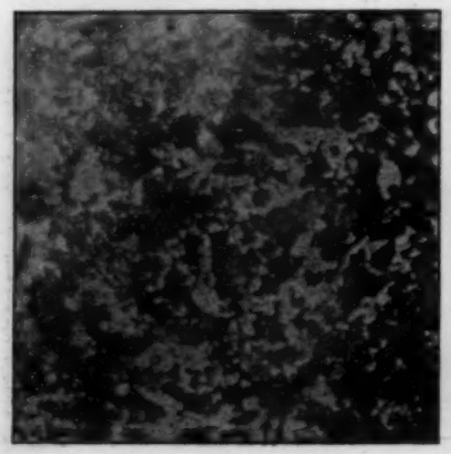


FIG. 5—ANNEALED 20 HOURS AT 825 DEGREES CENT.

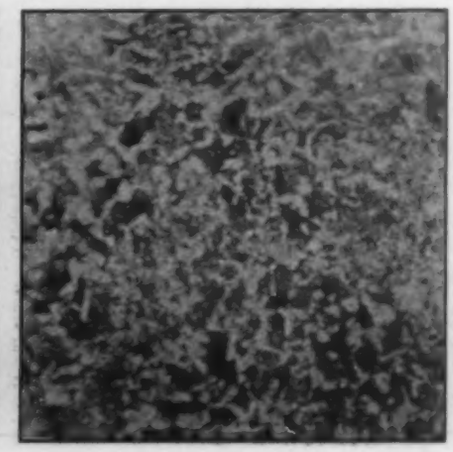


FIG. 6—ANNEALED 25 HOURS AT 825 DEGREES CENT.

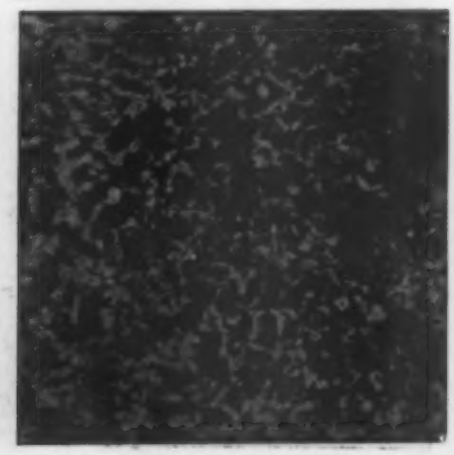


FIG. 7—ANNEALED 30 HOURS AT 825 DEGREES CENT.

Table III

Cost of Energy in Electric Furnaces

Vertical cylindrical electric furnaces rated 400 kilowatts; heating chamber, 6 feet diameter x 25 feet high; power rate, $0.0085 per kilowatt-hour.

Heating for Quench

Furnace Charge pounds	Energy kilowatt-hours	Pounds per kilowatt-hour	Temperature of heat treatment degrees Fahr.
21900	1874	11.7	1450
22500	1880	11.8	1450
21700	2088	10.4	1470
65900	5842	11.3 Average	

= 32.95 tons.

Kilowatt-hours per ton = $\frac{5842}{32.95}$ = 178 kilowatt-hours.

5842 kilowatt-hours at $0.0085 = $49.65.

$\frac{\$49.65}{65900}$ or $\frac{49.65}{32.95}$ = $1.52 per ton, for power charge.

Drawing Back

Rate of drawing at 1150 degrees Fahr. = 24 pounds per kilowatt-hour.
Kilowatt-hours per ton at 1150 degrees Fahr. = 84 kilowatt-hours.
Cost per ton at $0.0085 per kilowatt-hour = $0.71.
Cost per ton for the two processes = $1.52 plus $0.71 = $2.23.

growth of crystals, therefore methods of cooling should be employed which will give, the equivalent of furnace cooling for small pieces. In furnace cooling or complete annealing, strength and elasticity are reduced, and where these are of paramount importance, a modified ductility is accepted and proper normalizing of small parts and its equivalent for large ones, usually gives results meeting the specification for physical properties.

Variety of Furnaces Used

Heat treating is done today in a variety of furnaces, and while some are well suited to the purpose, others have not a great advantage over the methods used by primitive man, who heated his work in an open flame, oxidizing or decarbonizing the metal and later on covered it with coals and allowed it to cool in a crude forge fire. Within the past few years, the electric furnace, admirably suited to heat treating, has made its appearance.

The electric furnace, in laboratory size has done excellent work for some time past, but the furnaces discussed by the author are electrically heated furnaces of rugged design and construction, and of such capacity that they are handling large productions of heavy parts, and are so dependable they are not supported by reserve fuel fired furnaces.

The development and use of the electric furnace for heat treatment has progressed to the stage where furnaces are made with capacities up to 2700 kilowatts and accommodate charges of 320,000 pounds which may or may not be in one piece. The electric furnace, with tonnage and productive capacity sufficient for any industrial foundry, when intelligently used in heat treating of steel castings, will make it possible to develop the physical properties to a maximum for any grade of steel due to the fact that furnace variables, detrimental to the process, are practically eliminated. There are several general types of electric furnaces in which metals may be heated, but some form of resistance furnace is best adapted to heat treating steel. Certain work may be heated conveniently by induced currents in the charge itself, or by passing current through the parts, but the current induced or otherwise generated, does not flow uniformly through the structure, and hence does not produce the same uniform temperatures that obtain in the resistance furnace whose heat is delivered and distributed by radiant means.

Radiant heat is absorbed by the furnace charge more readily than convected heat, and less precaution is necessary in heating high carbon steels. As an illustration of what radiant heat will do as regards rate of heating, a steel bar, 3 x 3 x 12 inches, may be heated in a 1200 degrees Cent. furnace until, in 17 minutes, it has the same color and temperature as the furnace. Examination of the piece shows thorough penetration of heat, without any burning or cracking having occurred at the surface. This could not be duplicated in fuel fired furnaces without highly heating the outer surface, which results in burning or fusing and a change of carbon content.

Uniformity Insured

The electric furnace of the resistance type, affords a heat treating atmosphere free from contaminating gases. The operator is free from variation in his work due to absorption of sulphur, phosphorus, etc., from the products of combustion. The temperature distribution may be made uniform in the heating chamber if a properly designed electric furnace is used. The rate of heating and cooling may be controlled precisely either with or without the automatic attachment. The heat cycle once established may be repeated insuring uniform results in product. Electric furnaces may now be had in any size required by production in industrial foundries. Size of furnace does not influence heat control or distribution. Hence a furnace of ample capacity may be had for a given production

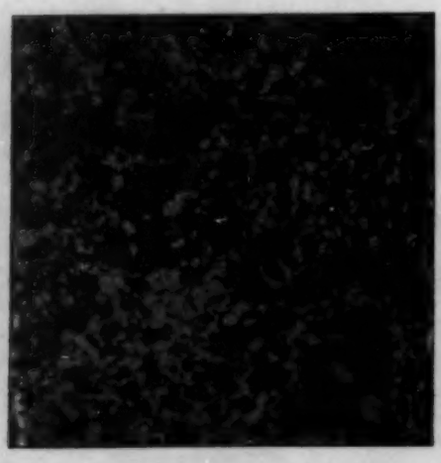


FIG. 8—ANNEALED 35 HOURS AT 825 DEGREES CENT.

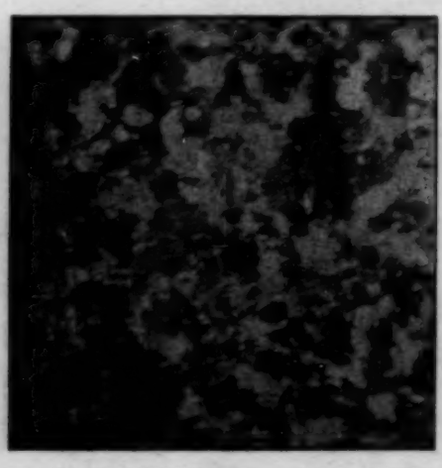


FIG. 9—ANNEALED 40 HOURS AT 825 DEGREES CENT.

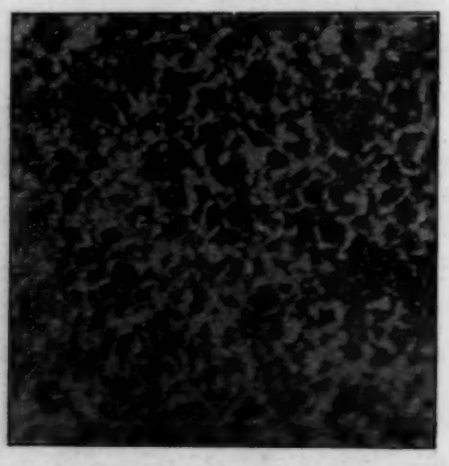


FIG. 10—ANNEALED 40 HOURS AT 825 DEGREES CENT AND 5 HOURS AT 950 DEGREES CENT

so sufficient time may be taken for the heat cycle, to insure proper heat penetration and satisfactory time for grain change.

Electric furnaces are available of such design that work may be passed through them by a conveyor or pusher, as well as car bottom or hand feed furnaces. These conveyors may be automatically equipped to charge and discharge continuously or intermittently. In many cases they are standard conveyors as used in fuel furnaces. Automatic control and a graphic record of temperature are recommended. A thermocouple and a controlling-recording instrument accomplished this task. These, when adjusted for the desired temperature, will maintain it indefinitely, and relieve the operator of the responsibility or will enable one operator to handle a group of furnaces.

Surface Not Overheated

In an automatic temperature control electric furnace, the regulator was set to heat a charge to 1500 degrees Fahr. Shortly after 11 a. m. the cold charge was placed in the furnace. The temperature of the charge increased as did also the resistor, until the surface reached the desired temperature, 1500 degrees Fahr., at 4 p. m. Here the temperature of the source was automatically controlled so that heat was fed to the charge to compensate for the equalization going on within. At about 4:40 p. m this equalization of temperature within the charge was complete. Automatically the charge was heated to a uniform temperature throughout, without allowing the surface of the charge to rise above the desired temperature.

Table IV

Physical Properties After Annealing

Sample	Heat treatment	Deg. Cent. of anneal	Carbon content	Tensile strength	Yield point	Elon. in 2" Per cent	Red. of Area Per cent
A1	as cast	No anneal	0.30	54,000	20,000	13	20
A3	Normalized	500	0.30	73,000	50,000	28	33
A1	6 hours anneal	850	0.30	73,500	41,000	24	38
A2	5 hours anneal	850	0.30	73,200	43,600	24	34
	5 hours anneal	950					
A2	Oil quenched and drawn	850 600	0.30	85,700	47,700	17	36

The electric furnace offers a radiant heat of uniform intensity, in an unmuffled heating chamber. The characteristics of the electric furnace are such that they may be made almost entirely automatic. This means an exact duplication of heating and cooling cycles. Therefore when once established, a given heat treatment can be again applied, with assurance that uniform work will result.

Fig. 11 shows three of a battery of four vertical furnaces. The fourth furnace is beyond the quenching tank. These furnaces were used in heat treating gun forgings and gave results tabulated in Table III, which shows the actual cost for energy in furnaces of moderate size. The overall cost for the month of October, 1918, for day and night operation, without shutdown of any kind was $2.76 per ton. This was just before the armistice, when production was at the maximum rate. This economy is very high, but it could be realized in almost any moderate-sized plant, if well designed and continuously operated. It costs money to shut down any furnace and heat it up again, and the electric furnace is no exception.

Advantages of Automatic Control

One reason for high economy is the fact automatic control prevents waste of heat, by not allowing the charge or furnace walls to become heated to a higher temperature than necessary. This is a large factor, because at such temperatures additional temperature is gained only at progressively higher cost per degree.

Reference has been made to the uniform temperature distribution in these furnaces. Tests were made by heating a vertical cylindrical furnace from cold to 950 degrees Cent., in which thermocouples were distributed as shown in Fig. 12. The data are also tabulated in Fig. 12, and show that the distribution is almost perfect.

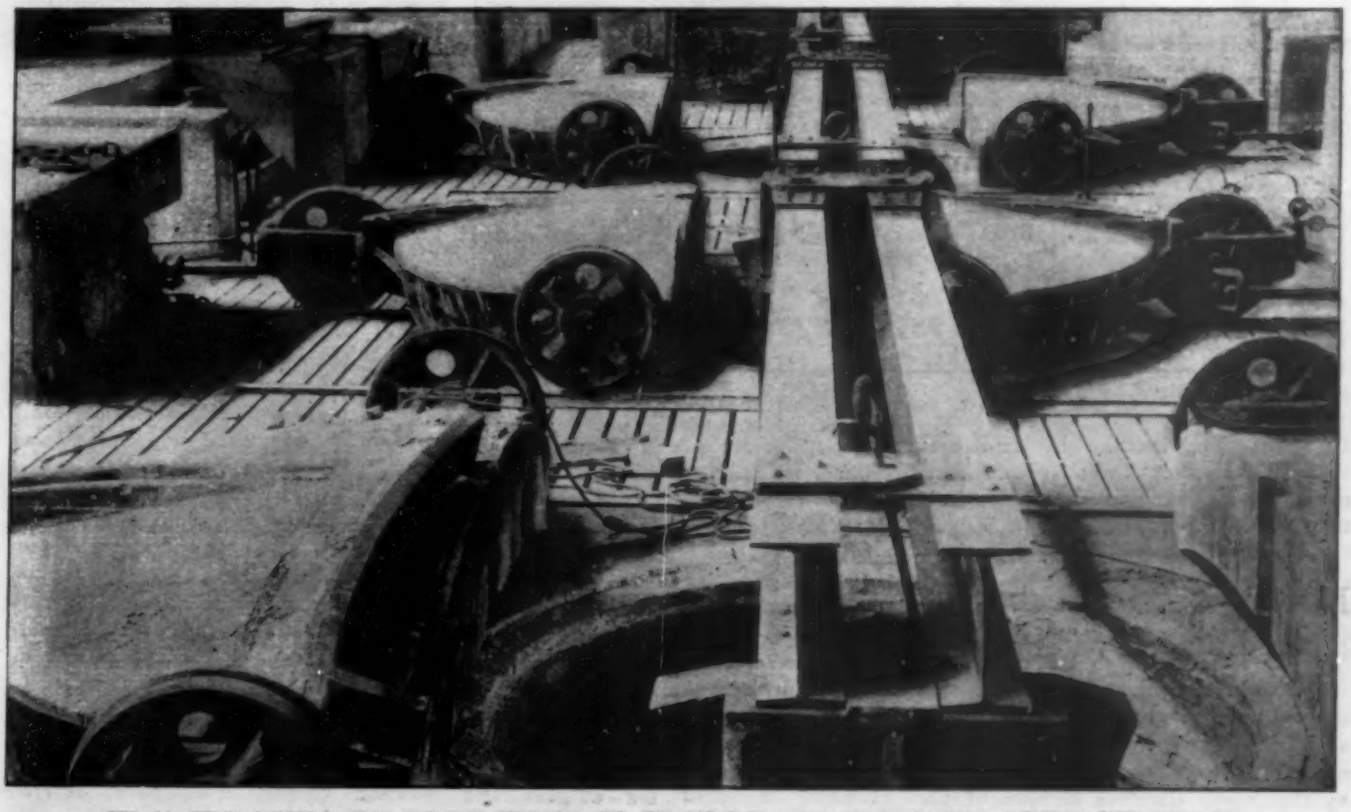
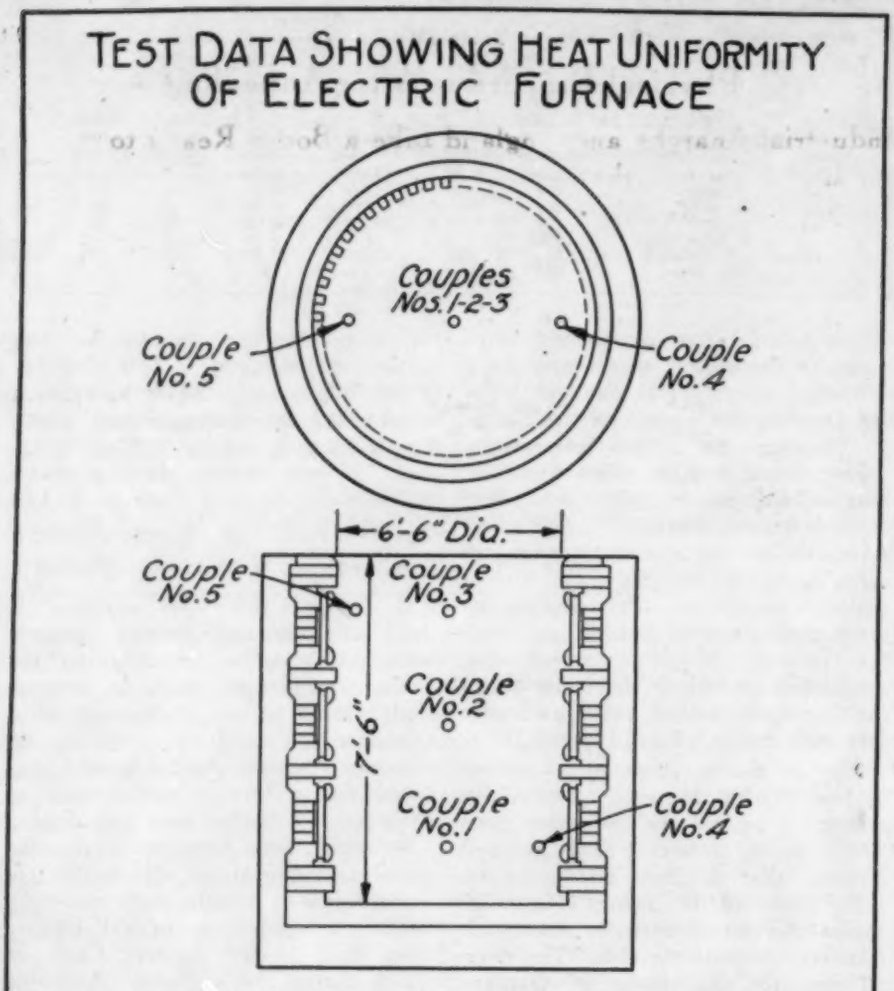


FIG. 11—THREE VERTICAL HEAT TREATING FURNACES FOR GUN FORGINGS. THE ENTIRE BATTERY INCLUDES FOUR FURNACES



TIME	THERMOCOUPLES-TEMP °C					AVERAGE TEMP.	PRESENT DEVIATION FROM AVERAGE	
	1	2	3	4	5		ABOVE	BELOW
11 30	25	25	25	25	25	25	0	0
3 30	527	537	532	530	545	534	2.07	1.31
7 30	670	679	671	666	669	669	1.5	.45
11 30	777	783	776	766	780	776	1.0	1.3
3 30	858	864	857	849	864	860	.46	1.3
7 30	860	865	862	862	863	862	.35	.23
11 30	928	934	930	930	928	930	.43	.21
3 30	933	932	927	925	927	929	.64	.43
4 30	950	950	952	952	955	952	.31	.21

FIG. 12—TEST DATA SHOWING UNIFORMITY OF HEAT IN ELECTRIC FURNACE

In conclusion, it may be said that upon the furnace depends to a very great extent, the success of the heat treatment.

Metal Tradesmen Oppose Metric System

Resolutions opposing the adoption of the metric system, and opposing any increase in wages to navy yard mechanics were unanimously adopted by the North Carolina division of the Southern Metal Trades association at a recent meeting held in the Monticello hotel at Norfolk, Va. Virtually all of the North Carolina members were in attendance as well as members and executive officers of the association from various parts of the South.

W. C. Wilson, of the American Institute of Weights and Measures, New York, addressed the meeting outlining the organized drive that is in progress to bring about the compulsory adoption of the metric system as the exclusive standard for weights and measures. The association is strictly opposed to any legislation looking to the adoption of this system and the following resolution was unanimously adopted following Mr. Wilson's address:

"Resolved that the North Carolina division of the Southern Metal Trades association hereby declares its opposition to any legislation having for its purpose the adoption of the metric system in the United States as the exclusive legal standard of weights and measures. Resolved, further, that we commend the work of the American Institute of Weights and Measures in opposition to the compulsory adoption of the metric system."

A copy of the resolution has been sent to all senators and congressmen representing North Carolina in congress. J. M. Taylor of the Ironmasters' Association of Norfolk, Va., addressed the meeting telling of the recent labor troubles with which Norfolk has been afflicted, and declaring that a grave situation impends if an increase in wages is granted shipyard employes and mechanics in the navy yards along the Atlantic coast. They have asked for an increase of 25 per cent.

William T. Harding, Raleigh Iron Works, Raleigh, N. C., president of the Southern Metal Trades association, presided at the convention.

Extends Scope of Work Apprentices May Do

The industrial commission of Wisconsin has adopted important amendments to the schedule of employments prohibited to children, with a view of promoting the state system of apprenticeship. One of these amendments will permit legally indentured apprentices under 18 years of age to grind their own tools for their own use on grinding wheels. The other amendment will permit legally indentured apprentices to use hand hoist or pneumatic hoists in bringing material to and removing material from machinery at which they are employed as a part of their training under the terms of their indenture.

Both these amendments relate only to legally indentured apprentices and only when they work under supervision. The permission to use grinding wheels also does not apply when apprentices grind any but their own tools for their own use. Production grinding by apprentices under 18 years of age will still be unlawful. Similarly the employment of apprentices as mere helpers in bringing material to and from machines will not be lawful.

The county commissioners of Montgomery county, Pa., have ordered plans made for four new bridges.

Europe's Labor Is in a Ferment

With Italy Steeped in Industrial Anarchy and England Like a Bomb Ready to Burst European Conditions Reflect the Logical Result of a Closed Shop Policy—All Countries Are Disturbed

BY H. COLE ESTEP
European Manager, The Iron Trade Review

BOILING over—this is perhaps the most apt characterization of the European labor situation at the present moment. These lines are being written during the second week in September, but there is no doubt the pot will still be bubbling and sizzling when they are printed. In view of what is now going on in Old World labor circles and the threat of more serious developments in the near future, a general review of the situation seems to be in order. As far as events are concerned, Italy is the center of disturbances at the moment, but with reference to possible future trouble the situation is much more disquieting in England.

Although the disputes involving the Italian metal workers and the British electrical workers have subsided the settlements effected are not of the kind which would be satisfactory to America's free industries. The British coal strike probably is avoidable but the miners are forcing an indefinite continuance of government control, demonstrating the power they have derived from closed shop conditions.

European labor developments are reflected more or less completely and more or less promptly in the United States, and in the writer's opinion American manufacturers who want to study first hand the ripened fruits of the closed shop policy may do so easily by turning their attention to the Old World. For a generation the closed shop has been a universally accepted principle in Great Britain, as well as to a large extent in France, Italy, Spain, Germany, etc. And today the results are written large so that all may read. They spell anarchy, sovietism, class tyranny, stagnation of industry, throttled production, high prices and finally social disruption and disaster. Nothing stands still in this world, and such are the fruits of the closed shop in Europe. Would the crop be any sweeter in the United States?

In Italy the metal trades have been in a perfect ferment. The Russian model of civilization seems to be specially attractive to the Italian workmen for the time being. For some time past the financial situation in Italy has been growing more serious, due to the inablity of the manufacturers to create sufficient exportable surplus to pay for the country's enormous imports. In the face of this state of affairs workmen in the machine shops, shipyards and other metal-working establishments, under the tutelage of their bolshevistic leaders whose avowed object is to communize the factories, were led to demand a 50 per cent advance in wages. Their pay had already been advanced to 200 per cent above the prewar standard, and the employers were obliged to resist this latest aggression.

SIR ROBERT HORNE
As president of the board of trade he has charge of the government's side of the controversy with the miners

In retaliation the unions determined on the following program in order to coerce the employers; which is given in the words of the manifesto issued by the labor leaders:

1. Production must be reduced to a minimum.
2. Work must be simulated, thus obviating any absurd pretext on the part of the management to resort to dismissal or lockout.
3. No files or other tools should be used unless they be in *perfect* order and fully suitable to the job on hand.
4. Every repair to machinery must take the longest possible time.
5. Nobody, for any reason, should attend to a different job from the one on hand, such as repairs, oiling, etc.

Finally it was stated that if employers dismissed the workmen they should take no notice of the dismissal but continue to enter the plant. Should the management resort to forcible ejection the men were instructed by their union leaders to proceed to violence. Should a lockout be enforced it was declared that the works should be re-entered at all costs, even by breaking in.

Somewhat unexpectedly this program has been thoroughly carried out, specially in the motor car, machine tool producing and general engineering district around Milan, with the result that at the moment of writing some 400 Italian factories have been seized and forcibly occupied by workmen's committees. Chaos is the result and production a joke. In many cases the technical staffs have deserted the workingmen's regime *enmasse*, and it has once more been proved that a big machine shop can not be run without brains and direction. In some instances members of the technical staff have been kidnapped and forcibly returned to the factories, but such a procedure is hardly conducive to orderly production. The workmen's committees have found no one who would buy what little they have produced, for fear of consequences and, of course, they are without credit with which to purchase raw materials.

A most ludicrous incident in connection with this *opera bouffe* in industry was the naive demand on the part of the workmen at the end of the first week of insurrection for their wages from their old employers. Those who remember the Caporetto disaster during the war, know how susceptible are the Italians of the lower, ignorant classes to propaganda, and in well informed circles the present situation although serious is not expected to be permanent. The employers are taking the situation calmly, wating for the furor to subside, but in the meantime heavy losses are being sustained.

In England labor events are moving to a crisis. The situation potentially is much more serious than the

actual upheaval in Italy, for the opposing sides in Great Britain are far more organized and capably led. Furthermore, the British are traditionally stubborn and when they get to quarreling among themselves serious results are likely to follow.

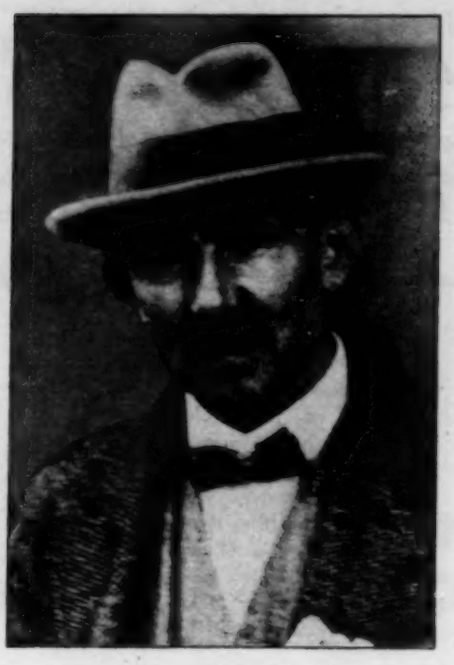
The most portentious event in British labor circles recently has been the formation of the council of action, ostensibly to use the strike to prevent war with Russia on behalf of Poland. The real purpose of this move, however, seems to be to lay the foundation for a soviet regime in England, and already subcouncils are being formed in various circles. J H. Thomas, head of the British railwaymen's unions, and heretofore recognized as a conservative and, level-headed labor leader, let the cat out of the bag with reference to the council of action on Sept. 7 at the Portsmouth trade union congress, when he said: "It constitutes a serious challenge to our constitutional forms of government." Some of the American newspapers which have been lauding this council of action movement as a wonderfully progressive step would perhaps do well to take heed of its true character.

The council of action program really appears to be simply part of a well defined movement now under way in Great Britain to substitute for ordinary parliamentary government through the ballot box, government by a class through the machinery of the labor unions. And the radical leaders, who seem to be more throughly in the saddle than had been suspected, appear to believe that the present is the time for a trial of strength between the old order and the new.

Hence the threat of a coal strike—a national calamity which may be even more serious for Great Britain than the railway strike of last year. In a compact country like England a coal strike would soon have a paralyzing effect, especially on the iron and steel industry. It is estimated that 3,000,000 men would be thrown out of work inside of three weeks and that all of the blast furnaces would have to be banked or blown out in 10 days.

An acute American observer who has been working *incognito* in the British coal mines says there is no real stomach for a strike among the men. Under such conditions defeat seems to be a foregone conclusion. But the leaders, headed by Robert Smillie, an able radical, seem to be determined to push the issue to a conclusion.

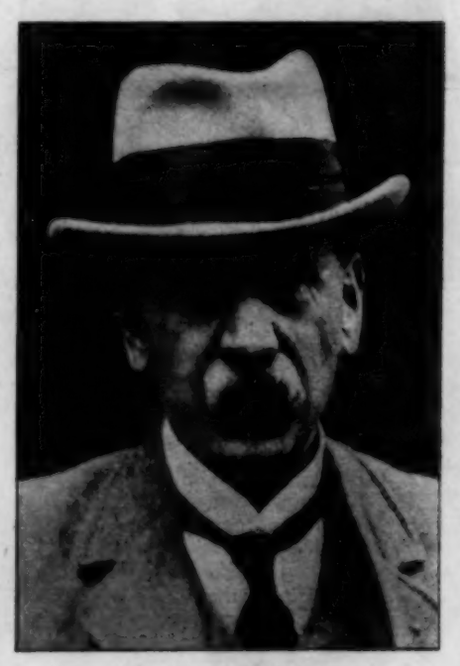
The stumbling block is the miners' demand for an increase in wages



J. H. THOMAS
President of the English railroad workers' unions—He is reported to be a conservative leader but is one of the leading spirits in the council of action

of 2 shillings a shift (40 cents) coupled with a reduction in the price of household coal of 14 shillings and 2 pence (about $2.50) a ton. This price has been approved by parliament. The root of the question, therefore, is whether the miners' union can overturn a parliamentary decision rendered by the duly elected representatives of the people. The controversy has advanced far beyond the industrial stage into the political arena.

At a conference with the president of the board of trade, Sir Robert



ROBERT SMILLIE
An able radical with tremendous potential power as leader of England's coal miners—He believes in the confiscation of coal lands

Horne, on Sept. 9, the miners announced that they would not give way on the question of the price of household coal, that they would not arbitrate their wages claim, and that they would not meet the coal mine owners. Such a stiff-necked attitude would seem to portend trouble.

The connection between the threat of a coal strike and the council of action movement is almost too obvious to require comment. But it should be emphasized that underlying the present series of labor disturbances in England is a serious attempt to subject a great nation to the dictates of government by labor union leaders.

In the meantime a sort of a side show, in comparison with the course of action proposition and the coal strike threat, is being staged by the electricians' union. The electricians employed in iron and steel works and manufacturing plants have contrived to get themselves locked out by their employers, because their leaders are insisting that foremen must be members of the union. The employers claim that foremen are essentially executives representing the management, and have won their point. The trouble all grew out of a dispute over one man, an electrical foreman in the steelworks of the Cammel, Laird & Co., at Sheffield. The labor leaders' attitude in insisting that foremen be members of the union is merely a logical step in the development of the closed shop idea, but at present this dispute is overshadowed by larger issues.

Sweden is another hotbed of European labor disturbance. In that country there have been a series of strikes and disturbances, specially in the iron ore mines, in a vain effort to maintain the artificial level of prosperity which was brought to the country by its neutrality during the war. Nearness to Russia has included a decidedly bolshevistic element in the Scandinavian situation.

In Germany for the time being there is more or less quiet, peace and order. Close students of events in this country believe, however, that all that saved Germany recently from another rebellion similar to that in Westphalia in March was the Polish defeat of the bolshevists. The capture of Warsaw was to have been the signal for an industrial uprising.

France after a series of disturbances last spring has set her house in order and right now appears to be settled down to a steadier pace than any of the big European powers. This end was accomplished by the government's taking a firm stand against the French revolutionary strikers,

rather than temporizing with them.

To recapitulate the European labor situation, France, Belgium, Germany, Spain and Holland are fairly quiet, with French industry perhaps in the best position.

Italy has been in an uproar which centered around the metal working industries. Sweden and Denmark are seriously disturbed. England has one national dispute in the engineering trades already on its hands, is confronted with an attempt to organize a soviet supergovernment, and although generally in the condition of a hand grenade with the fuse set going, may be saved from actual violence by the traditional English respect for fair play. Finally let us re-emphasize—it is in those European countries where the closed shop is most universally accepted that there appears to be the greatest danger of far reaching fundamental disturbances.

Melting Furnace Operates On Motor Circuit

A simple type of electric melting and refining furnace operated directly on a 220-volt motor circuit, without transformers, has been designed by Frederick Von Schlegell, of the Industrial Electric Furnace Co., 53 West Jackson boulevard, Chicago, and is being put on the market by that company.

The arcs are drawn, sustained and regulated by a balance system automatically giving stability and the builders claim that the operator requires no electrical knowledge. It is built with capacities of from 300 pounds to one and one-half tons per heat. It is stated it will melt or refine all ferrous and nonferrous metals which can be worked in cupola, open-hearth, air furnace, crucible or electric furnaces.

Smaller sizes are designed for brass foundries, for special tool steel work, small castings, for melting alloy for larger furnaces, making metal patterns, and for emergency or development work in large steel and gray iron foundries.

The furnace consists of a refractory-lined shell or body, the heat element being suspended through the roof. This element is in effect an electric arc torch, which diffuses a large, intensely hot flame. The shell is cylindrical and of extra heavy steel plate. It is mounted on a portable steel frame and special concrete foundations are unnecessary. Heavy rocker trunnions support the shell and allow it to lock after pouring. Tilting is by hand and all mechanical tilting equipment has been eliminated. If desired the furnace shell with its charge of molten metal can be lifted by a crane and pouring can be done direct from the furnace into molds without using a ladle. The furnace is built for single-phase, three-phase or direct current. With single-phase or direct current, two electrodes are used and with three-phase, three electrodes. They are held in place by a refractory sleeve so mounted that the sleeve and electrodes can be raised or lowered or swung aside to permit charging through the top opening of the furnace. This does away with side doors and prevents loss of heat.

The arrangement for raising and lowering electrodes makes possible a double furnace system and two shells are used with only one set of electrical equipment. The shells are set closely enough so that the same set of electrodes can be raised from one and set into the other. Thus one shell can be melting while the other is pouring and being recharged. The metal charged in this way can be preheated by the heat in the furnace or by gas or oil fire before the electrodes are swung into place. This duplex operation increases capacity and reduces floor space with a corresponding reduction in cost of metal.

The furnace is lined with an insulating coat next to the shell and a ganister lining mixed with a small percentage of fireclay and a pine tar product is rammed in place with air rammers. If desired, carborundum sand can be used instead of ganister. If basic lining is required it is made with magnesite and dolomite with basic slag and hot anhydrous tar for a binder. The roof is formed of 18 fireclay brick, 9 x 4½ x 2¼ inches, a standard size.

In the manufacture of by-product coke from 38 to 40 per cent of the gas recovered is used for heating the ovens according to results of calculations recently reported.

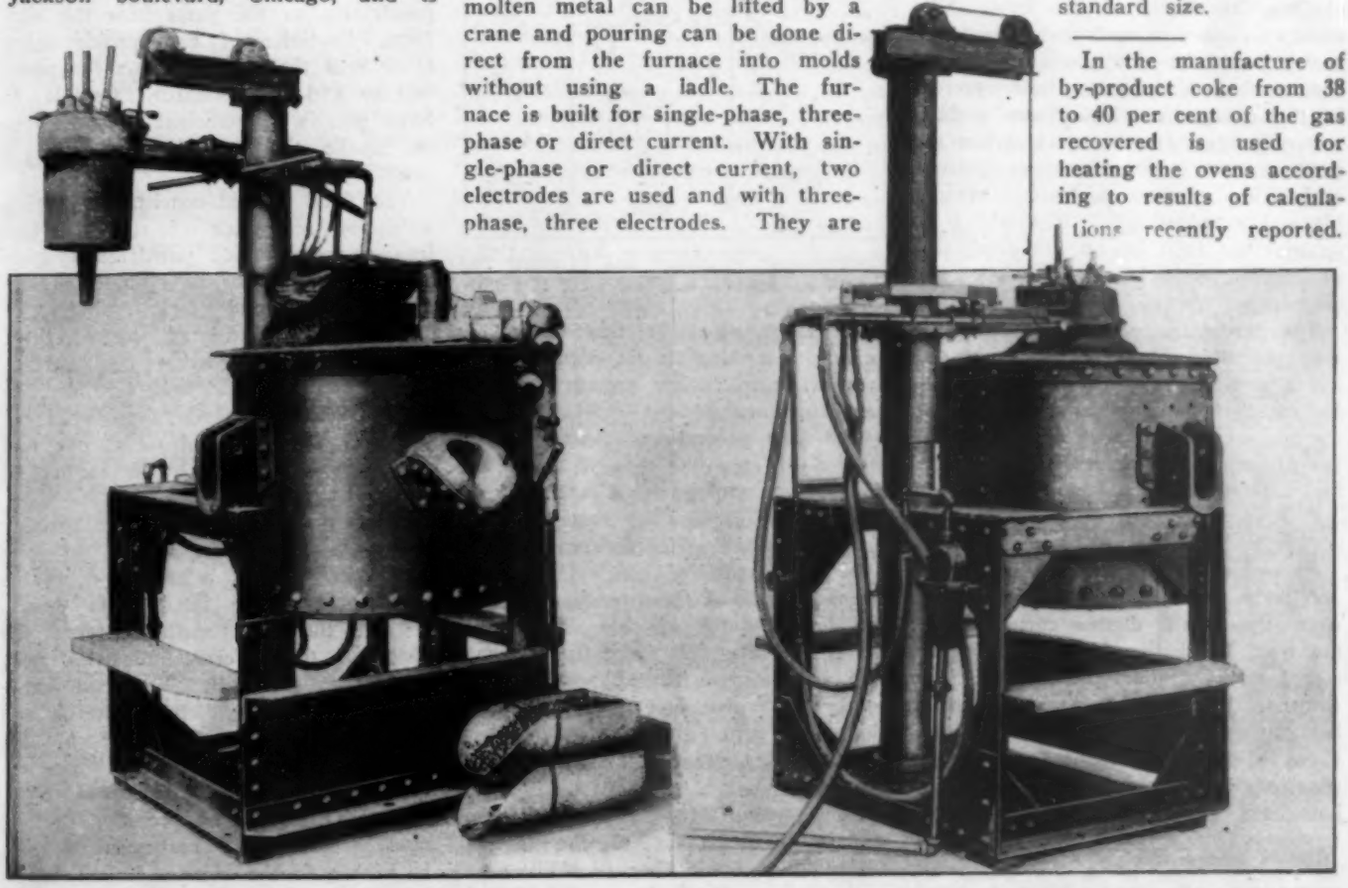


FIG. 1—FRONT VIEW SHOWING CHARGE READY TO BE PUT IN TOP OF FURNACE. FIG. 2—SIDE REAR VIEW OF FURNACE IN MELTING POSITION SHOWING ELECTRICAL CONNECTIONS

Furnace Aids Case Hardening

Cyanogen Gas Is Evolved From Vaporization of Alkali Cyanide Salt Heated Electrically—Steel Is Heated to Proper Temperature Independently and Introduced Into Gaseous Atmosphere for Absorption of Carbon

BY WILLIAM J. MERTEN

IRON and low-carbon steels absorb carbon from carburizers readily when in contact with these carbonaceous materials at temperatures above the upper critical point or the *AC-3* point. The quantity of carbon absorbed depends upon the temperature or degree of heat above the *AC-3* point; the character of the carburizer; the percentage of carbon present in the steel; and the presence of chromium, tungsten, manganese, nickel and silicon.

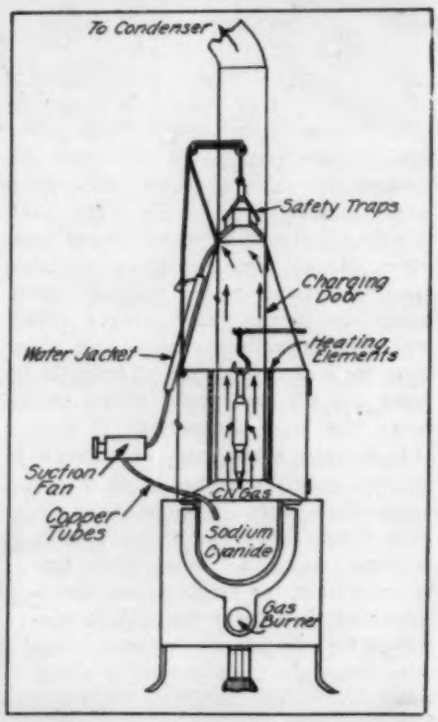
Upon the temperature or degree of heat above the *AC-3* point of the steel depends the absorption of carbon; the higher the temperature, the faster and deeper the penetration. This temperature is sufficiently high to change the iron to gamma iron which is capable of forming a solid solution with carbon or cementite. Beta and alpha iron do not absorb carbon to an appreciable amount.

Character of the carburizer is a very important factor in the successful conductance of case hardening, including the depth of the case. Elementary carbon as such is of secondary importance only. Oxygen and nitrogen compounds added or naturally present in the energizers which form carbonaceous compounds with solid carbon are necessary to generate nascent gaseous carburizing mixtures of carbon monoxide and cyanogen gas. Flourishing industries are built up on the production of these carburizing materials and energizers.

The percentage of carbon present in the steel used for case hardening also has a marked influence upon the affinity of the material for more carbon up to saturation, more specifically, a low-carbon steel absorbs faster than high-carbon steel.

Alloys Affect Absorption

Chromium, tungsten or manganese accelerate the absorption of carbon since they form double carbides with the iron. Nickel and silicon, however, retard the absorption, the fact that they form solid solutions with iron possibly being the cause for this retardation. From a previous statement which emphasizes the necessity of nascent carbonaceous gas formation for penetration and absorption or carbon, it is conceivable that if a properly heated piece of steel be brought into contact with pure nascent gas continuously generated in a separate unit or chamber and preferably under pressure, the conditions for case penetration would approach the ideal. A process of this type is presented in this paper but before describing it in detail, it is appropriate to review present day case hardening methods.



REGENERATIVE CYANOGEN GAS FURNACE FOR CASE HARDENING—ELECTRIC HEAT IS USED

The most general and commonly used method of case hardening is conducted by packing steel parts in a metal box filled with carburizing materials and firing the tightly closed box and contents at a sufficiently high temperature for the length of time necessary to give the desired depth of case. This process is simple and is successful if properly conducted in accordance with the prescribed procedure, experimentally determined to give certain definite results under definite and specific conditions.

Some manufacturers, however, find certain disadvantages to the method, including uncertainty or proper reaction within the closed box; difficulty in duplication of results as predetermined because of nonuniformity of carburizers; long time exposure of the steel to a heat not easily controllable, producing a questionable structural condition; and high cost of operation because of inefficiency of the heating method, initial cost and rapid deterioration of the boxes by oxidation or scaling.

Immersion Gives Thin Case

By the second method, case hardening is accomplished by immersing the steel article in a cyanide bath heated to about 1580 degrees Fahr. This process is convenient and effective on small articles only and where the depth of case required is not more than 0.005 to 0.015 inches, or where mere surface hardening is desired. It is a fast case forming method and from 10 to 15 minutes gives the necessary depth. The chief disadvantage claimed for this method is that no uniform case is produced. The parts deep in the melted bath do not get the same depth of penetration as the parts near the surface. Evolution of the cyanide gases at or near the surface favors the penetration and it is hardly feasible to have pots with sufficient surface area to handle the case hardening of a plant.

The third method consists of dipping a cherry red piece of steel or tool into a container of powdered cyanide salt, such as potassium cyanide, sodium cyanide, ferro and ferric cyanides, or sprinkling the powdered salt of these cyanides on the red hot steel surface and putting the steel back into the fire again. Case hardening produced in this way is but a superficial one and resistance to excessive wear cannot be expected.

In the fourth method, the carburizing gases are passed over a piece of steel heated in a retort, a method applicable to parts that are intricate in design. All of the four methods serve the needs of the different industries more or less satisfactorily. Box case hardening at best is dirty, wasteful and unsatisfactory in a number of instances. Case cyaniding by firing in fused cyanide salt is inefficient, unreliable, dangerous and costly. Retort case hardening with carbonaceous gases is a step in the right direction but it leaves something to be desired on account of the selection of the carbon-

From a paper presented at a recent meeting of the Pittsburgh chapter of the Heat Treaters' Research society. The author, William J. Merten, is metallurgical engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

aceous gases and the method of application.

The process to be discussed next, although still in the experimental stage owing to radical changes in the principle employed, appears to present opportunities for efficiency, preservation of the product, simplicity of operation, assurance of uniformity and duplication of results, speed of operation, reasonable cost, and wide range of utility. This method is known as regenerated cyanogen gas case hardening.

It is recognized that the most efficient carburizing gas is cyanogen, that the case is of greater uniformity, is more rapidly produced and penetrates deeper than one produced by carbon monoxide, but the highly poisonous character of the substance has been a serious objection to its use and the tendency is to lead the gas wastefully to the stack and out of harm's way, instead of controlling it to get maximum efficiency. To case harden steel and iron alloy articles in a stream of cyanogen gas evolved from a container filled with an alkali cyanide salt, heated by electrical energy or other means to accomplish vaporization or boiling of the salt, is the principle upon which this process is based.

The articles or material to be processed are heated independently out of contact with the fused cyanide salt. The advantage of this is appreciated in recalling the statements regarding the fact that case hardening is produced by contact with gaseous and not with solid carbon and more especially with cyanogen gas. Depth of penetration then is only a function of the uniformity of the temperature of the article treated and the duration of treatment. Nascent cyanogen gas has a speed of penetration of four or five times that of carbon monoxide.

The furnace, as shown in the accompanying illustration, embodies the regenerative principle since the excess gases not absorbed by the steel are forced under pressure into the fused cyanide bath. There they are reheated causing a vigorous stirring of the bath and a lively evolution of cyanogen gas, which leaves with more energy and in larger quantities, therefore more vigorously attacking the steel surface to cause accelerated and deeper penetration.

This regenerative type of furnace is a means to use the rather expensive salt economically, as the nitrogen gas on returning will combine with the sodium and a carbon supply in some cheap form such as charcoal can be added to the liquid as required, thereby retaining the original supply of cyanide salt intact. To prevent the poisonous gases which are under pressure from escaping into the room the suction fan is shut down before the door is opened. A bell ventilating device for inducing draft is arranged so as to open the bell when the fan stops and prior to opening the door.

Wherever possible parts of the pump or suction fan should be of nonferrous metals such as copper basic alloys or hard copper. Water cooling jackets or other protective methods are employed for return flues for hot gases and the nozzle end of the flue must be hard copper, monel metal or other nonferrous alloy with a high melting point. The speed of the pump or blower is to be regulated so as to cause the desired degree of circulation.

Sodium cyanide melts at 1112 degrees, Fahr. and boils at 1472 degrees, Fahr. The temperature of the pot, therefore, must be not less than the boiling temperature, and to effectively absorb this gas the steel should be at a temperature above the *AC-3* point or about 1650 degrees, Fahr. The particular furnace shown in the illustration is a design for the processing of shafts. A slight modification of the upper or steel heating chamber will adapt this furnace to a variety of work. Grates of a nickle-chromium alloy with knife edges supporting grate bars are employed in this modification.

Advantages of this process are the following: Simplification of temperature control, since the pyrometer is inserted directly in the heating chamber; uniformity and depth of the case produced in a comparatively short time; the elimination of the use and storage of carburizers and carburizing boxes; and inexpensiveness. The efficiency of cyanogen gas for case hardening has never been fully appreciated nor has it been obtained fully since during previous tests, the temperature was at or below the boiling point of sodium cyanogen, 1465 degrees Fahr., which is considerably below the *AC-3* point of the steel, but even in this unfavorable condition an exceptionally high speed of penetration has been noted by different writers on this subject.

While some of the less important features of this process are not fully determined because of the experimental stage of the development, the method is based upon well known principles and the conclusions have been drawn from careful study of general case hardening principles.

Swedish Iron and Steel Imports Increase

Imports of iron and steel by Sweden during May increased several thousand tons as compared with the two preceding months, according to an article in a recent issue of *Swedish Export*. During the month 22,300 tons were imported, while in April but 13,800 tons and in March 17,900 tons were imported. The month's imports brought the total for the first five months of the year to 80,300 tons as compared with 54,000 tons during the same period in 1919. These figures do not include 30,700 tons of railway material, pipe, etc., which was imported, and which is an increase as compared with the receipts during the same period in 1919, which were but 9000 tons.

On the other hand exports of iron and steel from Sweden show a considerable increase as compared with figures for the preceding months. During May, these exports totaled 30,500 tons compared with 19,250 tons in April and 15,500 tons in March. Exports of pig iron alone during the month amounted to 15,000 tons. Total exports of iron and steel for the first five months of the year were 92,500 tons compared with 104,000 tons during the same period of 1919.

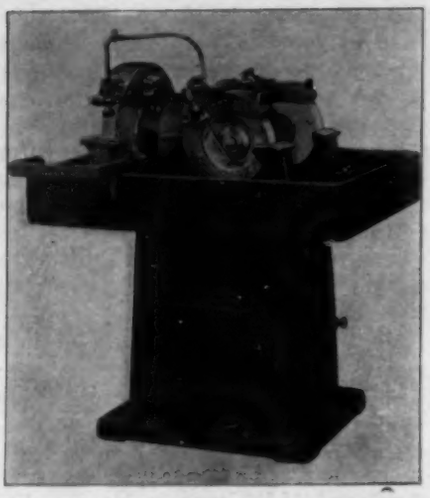
Figures show that exports of iron ore in May decreased. But 257,500 tons were exported, while in April, 297,000 tons and in March 242,000 tons were sent out.

Declares Managers Must Solve Labor Problems

Industry has seen higher wages gradually fail as a solution of the problem of greater production and must reorganize on another basis so that more responsibility will rest on managers of the country and not on either capital or labor, said I. A. Berndt, vice president and director of promotion of C. E. Knoeppel & Co., Inc., industrial engineers, New York, in an address recently before the railway club of Pittsburgh. He stressed the necessity of closer relations between managers and employes and of the "contact boss," who is in a supervisory position and can act as a medium to bring about better cooperation between employers and workers. The address in brief emphasized the importance of the human equation in the industrial world, the topic being "The Principles of Management." After defining the object, the speaker outlined a plan for the suggested reorganization and the big part that manager would play in it.

It is necessary, he said, to get the idea that the wealth of the country is not money, but production, wealth merely being production in excess of what is needed.

"The question," he stated, "is one of how much we produce and use, and of how to reorganize to get greater responsiblity. It lies neither with capital nor labor, but on you managers. Management has not received the status it should have."



THIS UNIT IS EQUIPPED WITH THREE WHEELS LUBRICATED WITH KEROSENE

New Tool Grinder Carries Three Wheels

The unit shown in the accompanying illustration is a 3-wheel oilstone wet tool grinder recently developed by the Mummert-Dixon Co., Hanover, Pa. This machine can be driven from an overhead countershaft or directly by a motor that is placed in the base. Coarse, medium and fine wheels are carried. The coarse wheel is for rapid cutting, while the medium wheel is suited for general tool grinding. The fine wheel is for the purpose of putting on a good finish. This wheel is said to be particularly adapted to sharpening scrapers.

The wheels are lubricated with kerosene which is supplied by a circulating pump. It is pointed out by the manufacturers that this medium makes an ideal lubricant for grinding wheels as it keeps the work cool and prevents particles of steel from clogging.

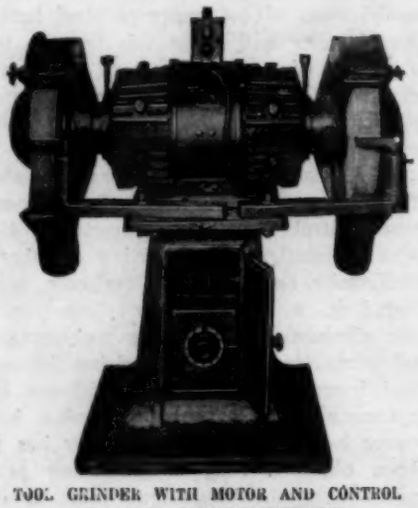
The wheel arbors are heavy in design and run in ball bearings. The bearings are carried in holders that are equipped with grease and oil retainers, the design being dust proof. The arbor which carries two wheels runs at one-half the speed of the arbor carrying the single wheel. The 2-wheel arbor is driven from the other arbor by means of 2 to 1 ratio steel bevel gears. These gears are enclosed in an oil-tight case which is filled with transmission grease. The wheels carried are one 2 x 16 inches, and two 2½ x 10 inches. It is pointed out that with the combination of three wheels, tool grinding can be carried out at a minimum cost. The machine weighs 1300 pounds with its motor and takes up a floor space of 33 x 41 inches.

Introduces Safety Plan

An innovation has been introduced, by the American Rolling Mill Co., Middletown, O., for providing safety for its workmen. The plan is being carried out by Dwight P. Robinson & Co., New York. Once each week a committee composed of workmen, mechanics and laborers inspect the entire plant with the purpose in mind of seeing that proper methods are taken to safeguard the employes against accident. These men make a detailed report to a representative safety committee which considers and puts into effect the recommendations of the inspection committee.

Motor-Driven Grinder Is Self-Contained

A motor-driven tool grinder has been placed on the market by the United States Tool Co., Cincinnati. The grinder shown in the accompanying illustration is equipped with a 5 horsepower direct-current, adjustable speed, Westinghouse motor. The grinding wheels are started or stopped by pressing a push button on the top of the motor frame. This push button actuates a Westinghouse starter with a speed adjusting rheostat all of which are located in the bottom of the machine frame.



TOOL GRINDER WITH MOTOR AND CONTROL APPARATUS TOTALLY ENCLOSED

On previous machines of about the same type, these push button stations were mounted directly in front of the motor frame but it was found that the workmen in using the grinders would start the motor by jabbing the button with the material which they intended to grind. With the new position for the buttons it is easier for the workmen to operate it with his hand than with the tool which naturally prevents misuse.

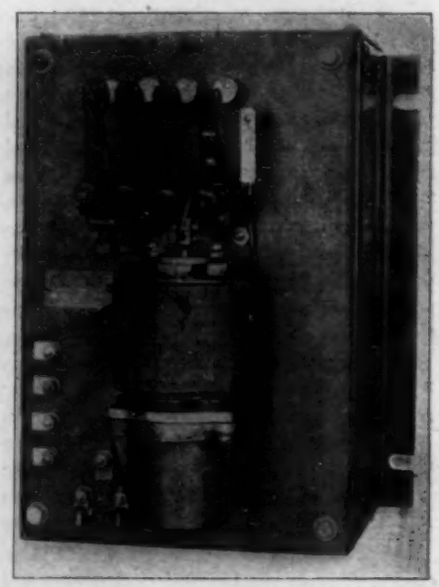
The proper annealing temperature for steel castings depends largely upon the carbon content. The range usually is from 1300 to 1650 degrees Fahr. for castings analyzing from 0.20 to 0.90 per cent carbon.

Motor Starter Has Time Limit Acceleration

The Cutler-Hammer Mfg. Co., Milwaukee, has redesigned its time limit acceleration automatic starter to include both larger and smaller sizes than formerly. The air dashpot has been replaced by an oil dashpot, with the former optional on the new equipment. The solenoid, plunger and rocker arm have been retained.

The new starter is made in capacities from ⅛ to 10 horsepower at 115 volts, and up to 25 horsepower at 230 and 500 volts. The 500-volt sizes are more compact than formerly. The oil dashpot is completely covered so as to be splash-proof, and is adjustable for time by an external screw. When the latter is once set, the starter will always cut out the resistor in the same length of time. A non-freezing dashpot oil is used, so temperature conditions will not affect the length of time for starting. The fingers on the rocker arm are of standard drum construction and, like the contact buttons, are renewable. The starter can be controlled from any remote point by a single-pole knife or snap switch, pressure or vacuum regulator, float switch, or by three-wire push button control. Low voltage release is inherent with two-wire control and protection with three-wire.

The starter is mounted on a slate panel carried on a pressed steel wall frame, with the starting resistance self-contained. Starters of this type are particularly adapted for starting direct current motors carrying loads which are liable to vary between wide limits and where remote control is desired, such as with pumps, blowers, compressors, and in similar service.



THE ACCELERATING FINGERS ON THIS MOTOR STARTER CLOSE ONE BY ONE AS THE SOLENOID ARMATURE MOVES UPWARD

Flasks Have Adjustable Sand Supports

Locks and hinges are eliminated in an all-steel self-releasing snap flask designed and made by the Oliver Machinery Co., Grand Rapids, Mich. Instead of unlocking and hinging back the walls, the molder presses a lever at either end which withdraws the sand support on either side and the flask is lifted up and slipped off without likelihood of the sand dropping out of the cope or breaking away. The cope and drag are made on a 5-degree taper or draft, the widest dimension being at the bottom of the drag or jackets.

The bench flask outfit, shown in the accompanying illustration, comprises a cope, drag and six jackets. Sand supports project inward at the parting line of the flask. The levers connect with these supports, withdrawing them when the flasks are to be lifted from the molds. The cope and drag are held together by malleable iron lugs and pins. The jackets are designed to match the mold made by the flasks, which are suitable for either bench or machine molding.

The snap flasks are made of 8 to 10 gage steel, all parts being riveted and braced with angle irons. The manufacturers point out that the steel flasks are free from liability to bulge or become warped out of shape. They cannot, of course, burn out and are not apt to be broken from constant rehandling. Another advantage is that the flasks can be stacked, to a reasonable height without danger of breaking.

An electric drive now is being installed at the plant of the Canton Sheet Steel Co., Canton, O., for operating eight of the company's hot mills. The latter formerly were operated through a rope by a horizontal steam engine. The installation is expected to be completed by the last of this month, when the mills again will resume rolling.

Produces Radius Cutting Tools for Lathes

The elimination of special toolmaking for radius work on lathes, shapers or planers is accomplished by the use of the cutting tools shown in the accompanying illustrations. Fig. 1 shows a convex cutter in use on a lathe and

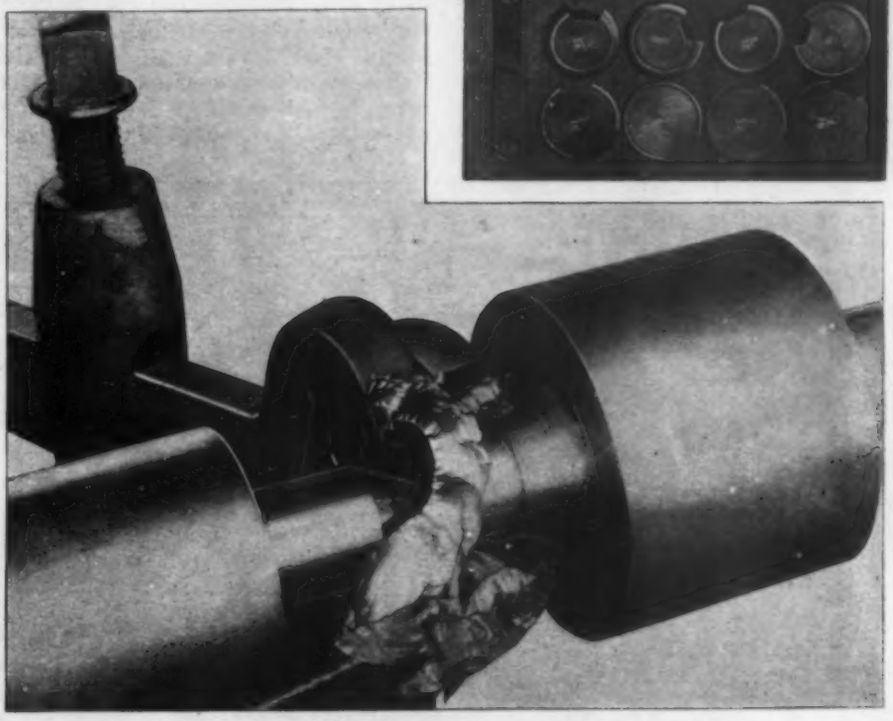
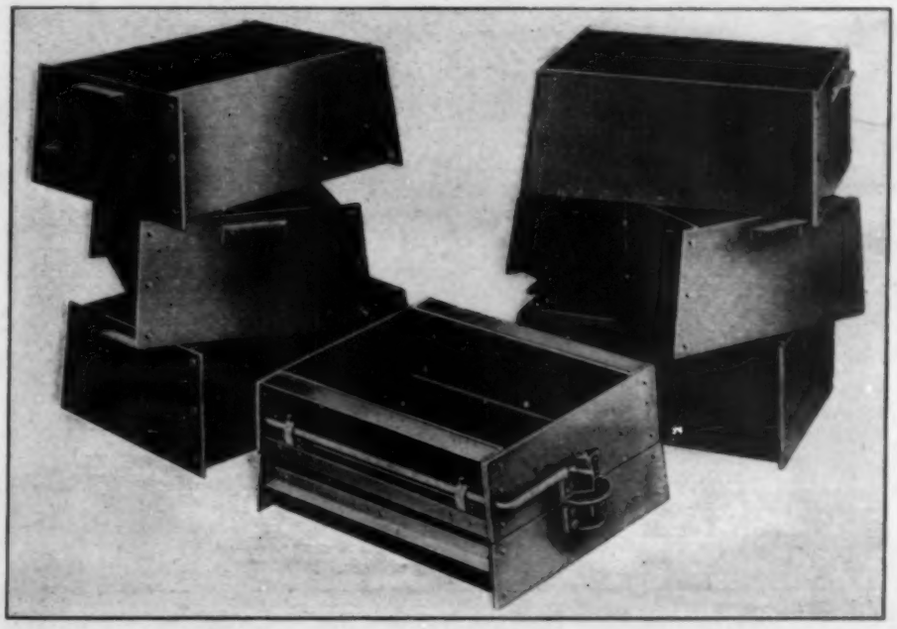


FIG. 1—CONVEX CUTTER IN USE ON A LATHE. FIG. 2—SET OF CUTTERS WITH HOLDER AND WRENCH



AN ALL-STEEL BENCH FLASK OUTFIT COMPRISING COPE, DRAG AND SIX JACKETS

Fig. 2 shows a number of the cutters, varying from ½ to 1 inch, either convex or concave. Each set contains a 60-degree cutter for cutting threads, together with a cutting-off tool. This latest production aid has been developed by the R. G. Smith Tool & Mfg. Co., 315-317 Market street, Newark, N. J.

Instead of making a special tool for any individual job, when the machinist wishes to turn a ¼-inch radius, for instance, either convex or concave, he inserts a standard ¼-inch cutter in the holder, which then is attached to the machine. When the cutter becomes dull it is an easy matter to grind it so that the cutting face intersects the axis of the disk, which makes for accuracy.

The tools are sold in sets which include the patented holder, ½ x 1⅛ x 6⅝ inches, and the wrench shown in Fig. 2.

Sir Arthur Pease, a leading figure in British financial and steel circles

and the Northeastern railroad, one of England's large transportation interests, visited Chicago recently to study electrification plans now being made by the Illinois Central railroad for its lake front terminal, with the idea of gaining information to assist in similar work in London.

According to Tampico oil statistician, Mexico will export during 1920 between 130,000,000 and 135,000,000 barrels of oil more than all the rest of the world, including the United States.

Adapts Rod Presses to Automotive Work

BECAUSE of an increasing demand, particularly in the automotive industry, for tie rod presses which can be adapted to large bending, blanking, pressing, shearing, multiple punching, group punching and other similar operations, Williams, White & Co., Moline, Ill., has completed the two large presses of this type, shown in the accompanying illustrations. Fig. 1, shows the 800-ton press which is utilized for blanking out side rails for motor truck frames, while Fig. 2, shows the 500-ton press, similarly designed, which is used for a similar purpose on side rails for pleasure car frames.

While the machine as a whole has been carefully designed and close attention has been given to all details, three features appear to stand out more than others: First, all gears and operating parts are located overhead, so that the work can be placed and removed from the front, back or either end and for this purpose the side housings are made with ample openings between the tie rods; second, the tables and rams are designed with ample die areas and openings and T-slots allow for the rearrangement of tools for various jobs; and third, the principle of construction is such that all vertical operating stresses and strains are taken up by heavy forged steel tension members which fasten table, housings and bridge tree together and eliminate the possibility of broken side housings. All castings, for these presses are made in the company's foundry and weigh up to 35 tons.

The following table gives the principle dimensions of the two presses:

	500 tons	800 tons
Capacity	500 tons	800 tons
Distance between housings	16' 0"	18' 0"
Table width	0' 30"	0' 30"
Ram face width	0' 30"	0' 30"
Die space, ram up, adjustment up	0' 23"	0' 23"
Die space, ram down, adjustment down	0' 11"	0' 11"
Stroke	0' 7"	0' 7"
Die space adjustment	0' 5"	0' 5"
Window openings in housings	0' 24"	0' 24"
Height overall	21' 0"	24' 7"
Length overall	21' 10"	24' 9"
Width overall	10' 6"	13' 2"
Strokes per minute	12	8
Drive motor	75 h.p	100 h.p.

Die space adjustment in these presses is made by large screws in the pitmans, or connecting rod, operated through worm gearing by a separate motor mounted on the ram. Each steel holddown or stripper has a T-slot in its face for attaching specially spaced contact fingers, and are operated by cams on the main crankshaft. The table has four T-slots and an opening 6 inches wide and as long

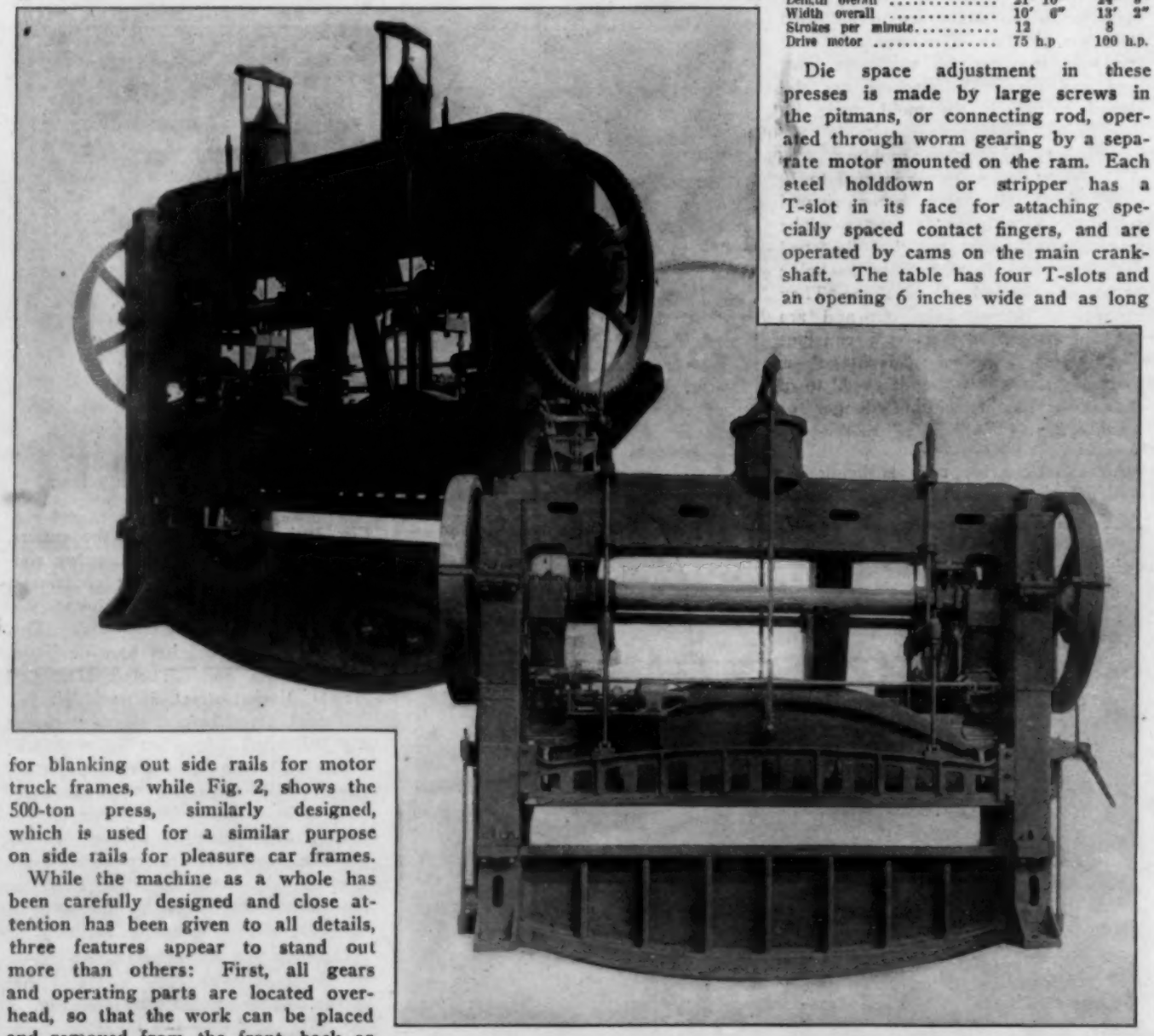


FIG. 1—800-TON TIE ROD PRESS USED FOR BLANKING OUT SIDE RAILS FOR MOTOR TRUCK FRAMES. FIG. 2—BELOW, 500-TON PRESS USED FOR SIMILAR PURPOSE ON PLEASURE CAR FRAMES

as the machine. The ram face has five T-slots. The clutch is of the friction type, with liberal surfaces, and all gears are made of steel. Automatic stop and brake are provided as is also an automatic die kick-out, which is connected to the ram and operated by it to strip the work from the dies. Twin drive is employed with cut tooth drive gears and pinions on each end of the main shaft for equalizing the drive and eliminating torsional lag.

Need Piecework To Restore Railroad Shop Output

A return to the piecework basis is necessary to railroad shop efficiency, according to a statement by J. C. Fritts, master car builder of the Delaware, Lackawanna & Western railroad, before the New York railroad club recently. This would increase efficiency at least 30 per cent.

"In the fall of 1918," he said, "piecework was abolished generally throughout the country and rates of pay for all employes for the various crafts adopted. In the equalization of rates, the benefits derived from the incentive of the individual to increase his income, and at the same time the ouput, was lost, and the most competent mechanic today feels that he should not turn out more work than one of lesser skill because he is receiving the same pay.

"I believe a piecework schedule that is eminently fair to the employes and railroad company should be worked out. The principles surrounding the piecework system are the same as the rights every citizen of the country demands, that is, that he should be given an opportunity to advance in accordance with his individual efforts."

Opens New Warehouse

A warehouse for the Colonial Steel Co., 324 Fourth avenue, Pittsburgh, has been established at Cleveland. The building previously occupied by the Betz-Pierce Co. has been rented where the Colonial company will maintain its own stock of high speed and carbon tool steels. F. L. Stevenson, 1104 Prospect avenue, Cleveland, has been named manager.

Will Install Bar Mill

The Collins Co., Collinsville, Conn., established 94 years ago, manufacturer of axes, hatchets and matchettes, has decided upon extensive changes in its plant and will install a bar mill and add steelmaking capacity. Barton R. Shover, Oliver building, Pittsburgh, is consulting engineer for the work.

News of Societies

Past and Coming Meetings of National and Local Trade and Technical Organizations

TWO sessions of the first fall meeting of the American Institute of Electrical Engineers will be held in Philadelphia, Oct. 8, at the Bellevue-Stratford hotel. Replicas of apparatus which was used by the pioneer discoverers in their experiments will be on exhibition. The program follows:

8:30 a. m.—Registration.
9:00 a. m.—Meetings and papers committee meeting.
10:30 a. m.—Meeting of board of directors.
2:30 p. m.—Technical session.
Economic Study of Secondary Distribution, by P. O. Reyneau and H. P. Seelye.
Electrical Demand Measurements, by P. A. Borden.
Discussion.
6:30 p. m.—Informal subscription dinner Bellevue-Stratford hotel.
8:30 p. m.—Anniversary of early discoveries.
The Epoch Making Discoveries of the Years 1819 and 1820 with Special Reference To the work of Ampere, Arago, Davy and Oersted, by Prof. Elihu Thomson.
The Significance of the Discoveries of Ampere, Arago, Davy and Oersted in the Development of Science in the Past Hundred Years, by Prof. M. I. Pupin.

* * *

Explains Advertising Organization

At the Engineering Advertisers' association recent meeting in Chicago, G. R. Schaeffer, advertising manager, Marshall Field & Co., discussed the subject of "The Management and Organization of an Ideal Advertising Department." In the address the speaker stated that advertising must be surrounded at all times with an atmosphere that reflects the character of the institution it represents. At the October meeting of the society market analyses and sources of advertising data will be discussed.

* * *

Implement Men to Meet

The National Implement & Vehicle association will hold its twenty-seventh annual convention at the Hotel Traymore, Atlantic City, N. J., Oct. 20-22. A special train over the Pennsylvania railroad will leave Chicago, Oct. 18, picking up passengers on the way east and being joined by a train from St. Louis at Pittsburgh. Sessions will begin at 1 p. m., Oct. 20 and succeeding days.

The program will cover the problems of transportation, finance, agriculture and other subjects of importance to the industry. Social features will be provided for the entertainment of ladies accompanying delegates. The annual banquet will take place Friday evening with an appropriate program.

* * *

Cleveland Steel Treaters Meet

Opening its winter schedule of monthly meetings, the Cleveland chapter of the American Society for Steel Treating met at the Cleveland Engineering society rooms, Friday evening, Sept. 24 and heard as speakers, Lieut. Col. A. E. White, professor of chemical engineering, University of Michigan, Ann Arbor, Mich., the national president and T. E. Barker, production engineer Miehle Printing Press & Mfg. Co., Chicago, the national first vice president. Although the remarks of both had to do largely with the accomplishments of the recent amalgamation of steel treating societies and the Philadelphia convention, President White presented informally a review of the discovery and development of his science dealing particularly with its effect upon metallurgy. Officers at the Cleveland chapter for the coming year are: Chairman, J. V. Emmons, Cleveland Twist Drill Co.; vice chairman, Charles M. Campbell, Pioneer Alloy Products Co.; secretary and treasurer, Ray F. Bayliss, James H. Herron Co.; directors, C. G. Shontz, Perfection Spring division Standard Parts Co., and W. S. Biddle, W. S. Biddle Co.

Convention Calendar

Oct. 4-8—American Foundrymen's association. Annual convention and exhibition, Ohio state exhibition grounds, Columbus, O. C. E. Hoyt, Marquette building, 140 South Dearborn street, Chicago, is secretary.

Oct. 4-8—Institute of metals division of the A. I. M. E. Annual meeting with American Foundrymen's association at Columbus, O.

Oct. 11-13—National Association of Purchasing Agents. Annual convention at Chicago.

Oct. 19-22—National Hardware Association of the United States. Anaual covention, Marlborough-Blenheim hotel, Atlantic City, N. J. T. James Fernley, 505 Arch street, Philadelphia, is secretary-treasurer.

Oct. 20-22—National Implement and Vehicle association, Hotel Traymore, Atlantic City, N. J.

Nov. 10-12—Society of Industrial Engineers, Pittsburgh. S. T. A. Loftis, 327 South LaSalle street, is secretary.

Nov. 17-18—National Founders' association. Annual convention, Hotel Astor, New York. J. M. Taylor, 29 S. La Salle street, Chicago, is secretary.

Dec. 7-10—American Society of Mechanical Engineers, New York. Forty-first annual meeting. Engineering Society building, New York. Calvin W. Rice, 29 West Thirty-ninth street, New York, is secretary.

Plan Action on Acceptance Abuse

Faith in Trade Acceptance Instrument Unshaken, Leading Advocates Say—Reserve Board May Strike at Misuse—No Credit Plan Puncture Proof With Money Tight as Now

BY JOHN W. HILL, FINANCIAL EDITOR

WIDESPREAD abuse of trade acceptances, which has grown out of the present tight money situation, has not shaken the faith of leading advocates of the acceptance movement in the utility or economic value of the instrument. Misuse of acceptances, it is pointed out, is merely one form of the general stretching of credit accommodations being attempted by many concerns now. Under existing conditions, in the words of one eminent authority "even an instrument of Divine origin would not be puncture proof."

Nevertheless, the various abuses of acceptances which have come to light have caused some alarm in the ranks of the instrument's principal proponents. They assert that misusing trade acceptances amounts to employing bogus paper and should not be considered as an argument against acceptances any more than counterfeit money is an argument against good money. Yet they admit that the trend of affairs now, unless checked, threatens to discredit the acceptance.

As a result the problem is being seriously studied by the federal reserve board, the National Association of Credit Men and the American Acceptance council. Drastic action directed against the use of acceptances for past due accounts and other irregular purposes has been forecast by a member of the federal reserve board. The steel industry has felt the acceptance misuse mainly because of its contact with the automotive industry, where trade reports agree that collections have been slow.

The action of the Motor and Accessory Manufacturers' association in going on record, at their recent meeting in Cleveland, as opposing any form of trade acceptance abuse and in warning its members against the practice, has been commended by Robert Bean, executive secretary of the American Acceptance Council and J. H. Tregoe, secretary of the National Association of Credit Men. In a letter to THE IRON TRADE REVIEW discussing the trade acceptance movement, Mr. Bean said:

"In times like these many concerns are resorting to methods which they would not ordinarily countenance if credit conditions were different. Some rather unscrupulous concerns seized upon the trade acceptance as a means to secure additional time or capital. Both practices are roundly condemned by the Council and by all high-grade business concerns the country over.

"However, there is no reason to be disturbed over the acts of these concerns. I think if we will all consider it—every form of credit instrument whether it be the acceptance, promissory note, or even check, is being severely tested in these times when money for other than strictly legitimate uses is so hard to obtain. The American Acceptance Council has taken a very definite stand on the question of abuses and will shortly issue a statement condemning such practices and pointing a way to the proper, safe and sound use for this highly desirable credit instrument."

Secretary Tregoe of the credit men's association, likewise has not been discouraged as a result of present conditions. He says in a letter to this publication:

"During the present stringency all sorts of devices have been resorted to for credit accommodations and I don't believe that an instrument of Divine origin could be puncture proof. Failure to meet credit terms has been one of our chief trade abuses and if it is recalled that not one-half of the open accounts are met in strict agreement with sales terms, you will understand how very easy it is for any kind of credit instrument to be abused. I believe more firmly than ever in the utility and economic value of acceptances. The country is offered a wonderful opportunity to transform its credit practices and bring greater order into its commerce by substituting a written acknowledgement of the obligation for merely ledger charge.

"What has been termed abuses of the trade acceptance is a misnomer. Tendering and receiving an instrument in the form of a trade acceptance to liquidate an overdue account is merely presenting a bogus instrument, because as a matter of fact an acceptance to liquidate an open book account irrespective of its wording is not under the federal reserve act and regulations of the federal reserve board, a trade acceptance. Tendering a similar instrument for the renewal of an unpaid trade acceptance is also a misnomer. The same is true of tendering a trade acceptance for merchandise bought and not delivered or put in transit. Credit departments should determine the bogus instrument. They should point out the injury that will result to our credit commerce if such instruments are given circulation, especially for discount at the banks."

Trumbull Offers Stock

Sale of stock of the Trumbull Steel Co., Warren, O., at $27.50 a share has gone into effect and 80,000 shares have been offered to employes for subscription under plans worked out by the directors. The stock has a par value of $25. The last sale was at $30.75. The stock is sold on the installment plan, $1 a month per share being deducted from the employes' wages. An extra dividend of 4 per cent to those employes who remain with the company, starts Jan. 1, 1922, and increases 2 per cent a year for three years. The bonus amounts to 10 per cent Jan. 1, 1925. It will not be paid on more than 100 shares to a person.

Superior Steel Co. Gets Few Cancellations

Prediction that there will be no radical decline in the price for steel products is made by President E. W. Harrison, of the Superior Steel Corp., Pittsburgh, in the company's earnings report for the six months ended June 30. According to the company's head many new orders are being received despite the decreased demand for steel. Some cancellations have been received, he says, but their total would make a very small percentage of the amount of orders on the company's books.

Net income of the company for the first half of the year, after federal taxes, was $918,072 against $325,066 in the corresponding period of 1919. Net sales for the six months were $6,351,843 against $3,056,041 and cost of sales $4,471,333 against $2,386,219. Depreciation, federal taxes, sinking fund obligations, etc., cost the company $1,112,381 and dividends of $326,309 were paid. This left a surplus for the period of $591,763 compared with only $19,043 one year before. The balance sheet shows that inventories were $2,055,814 as compared with $2,427,360 one year previously. The comparative balance sheet follows:

	1920	1919
Net sales	$6,451,843	$3,056,041
Cost of sales	4,471,333	2,386,219
Gross profit	$1,980,510	$669,822
Miscellaneous income	49,943	53,268
Total income	$2,030,453	$723,090
Depreciation, federal taxes, sinking fund, etc.	1,112,381	398,024
Net income	$918,072	$325,066
Dividends	326,309	306,023
Surplus	$591,763	$19,043

Recommend Mine Tax System

Report of Special Committee Representing National Tax Association, After Two-Year Study Is of Special Importance as Iron Ore Tonnage Tax Bobs Up Again—Equalization and Ad Valorem Method Favored

AN IMPORTANT document relating to the taxation of mining properties with particular reference to iron ore was submitted at the thirteenth annual conference of the National Tax association in Salt Lake City, Utah, Sept. 6 to 11. This was the report of the special committee on mines taxation, of which R. C. Allen, geologist and vice president of the Lake Superior Iron Ore association, is chairman.

The National Tax association is composed of professors of economics and political economy in some of the leading institutions of learning in the country, state tax commissioners, tax officials generally and others vitally interested in the study of tax measures and in bringing about better methods of taxation. The association has been at work for a number of years in analyzing taxation problems, and the subcommittee on mines taxation began its work on this particular problem in 1918.

Briefly, the special committee approves the principle of equalization of taxation of mines and other real estate, opposes the classification of real estate, including mines, for taxation at different levels, or by different methods, and advises inclusion of the *ad valorem* system of mines taxation under centralized state authority and control.

The report is especially significant in view of the continued efforts of politicians in Minnesota to keep the tonnage or mine tax issue alive, and for reason of the fact that a tonnage tax bill will be considered by the legislature of the state in January. As stated in the Sept. 30 issue of THE IRON TRADE REVIEW, the Republican party of Minnesota is pledged by platform to place a tonnage tax on iron ore, while the Democratic nominees for governor recently declared himself to be in favor of such a tax. The tonnage tax was defeated twice in recent years by vote of the governor, but at present it appears that the chances are extremely favorable for the final enactment of such a measure. **The report follows:**

The committee on a model system of state and local taxation recommends for general adoption by the states three principal taxes, viz., a personal income tax, an *ad valorem* tax on tangible property and a tax on business. Concerning the taxation of mines it said, "We are agreed that mines should pay, under whatever method may be adopted, a tax commensurate with that paid by other real estate in the same taxing jurisdiction." We feel that in deference to the main committee, we are bound to proceed with a consideration of the subject under the limitations imposed by this principle. It is the principle which is embodied in the laws and consitutions of most of the states. It was approved by the special committee on mines taxation reporting in 1913, and we believe is supported by the main body of intelligent opinion in this country.

If, then, mines should pay to state and local governments a tax commensurate with that paid by other real estate how should the tax on mines be imposed and collected? Our answer is, in precisely the same manner that taxes are imposed and collected on other real estate. The committee on model system would retain the *ad valorem* tax on other forms of real estate with modernized administration. In our opinion the equalization of the taxes on mines with those on other real estate requires that no exception be made in the case of mines.

Local Interests Paramount

This opinion is governed by a study of the economic and industrial situation prevailing in the typical mining communities of the country in relation to the proposed model system of taxation. The populations of these communities are almost entirely dependent on the mines. In a great majority of them the value of mining property exceeds that of all other property. No other important values exist. A few mines, and here and there a single mine, supports almost the entire population of the local taxing jurisdiction in many cases numbering thousands of people. So long as the mines exist other real estate has value but when they are exhausted no value or only nominal value. The community itself shrinks and not uncommonly vanishes with the exhaustion of the mines. In these jurisdictions the mines must pay most of the taxes, it matters not under what system they are levied. On the Mesabi range of Minnesota the iron mines paid in 1919 an *ad valorem* tax amounting to 92.643 per cent of the whole tax levy and in Michigan in the same year 74.51 per cent of the taxes levied in the 29 local jurisdictions in which they are located. The same relationships exist in the Michigan copper country and are typical of many of the other important mining centers of the country.

Now, if, in the model system the *ad valorem* tax on mines is abandoned in favor of a tax on income or product the local community will lose control of its main source of revenue and in lieu of the *ad valorem* tax it will receive such portion of the tax on income or product as may be prorated to it by the state, and this portion will be an annually fluctuating sum, large in periods of flush production, small in periods when the mines are operating at part capacity and nothing at all when the mines are closed. The tax paid by the mines would bear no relation to revenue requirements. Therefore, in periods of idleness or low production or low income the main burden of the taxes would fall on other property, for the income of the community itself depends on the operaion of the mines and it follows that the personal income tax would fail with the mines tax. The effect would be that the tax rate on other property would be controlled largely by the amount of the mines tax and personal income tax and would fluctuate upward and downward inversely with the productivity of these taxes. In certain periods the tax rate on property, not including mines, would be too great to be withstood and in others it is conceivable that no tax would need to be levied on such property. Certainly there could be no current equalization of the taxes on mines and other real estate and of course, therefore, none in the long run, for a moment's thought is sufficient to reveal not only the political difficulties in the way of frequent revisions of the tax rate on the income or product of the mines but also the variables in the equation which in themselves would defeat a fair solution of the problem.

It should not be forgotten in discussions of mines taxation that the interests of the local taxing jurisdictions are paramount in any system of taxation devised for the American state. The bulk of the public expenditures is not made by the state or by the state and counties combined, but by the cities, villages, townships, school districts, and local jurisdictions of other descriptions. The tax on property has been the mainstay of the local community it would be under the proposed model system. Whatever may be the merits of the taxes based on the production or on the income of mines from the viewpoints of the state and the mine owner, they are ill adapted to the requirements of the local communities. The necessary control of the rates of such taxes by the state deprives the local mining jurisdiction of control over its own finances to an embarrassing degree and imposes on it a tax system which would starve the treasury in some periods and flush it in others. Those who are familiar with local finances and local politicians will hesitate to pronounce which is the greater evil, an empty treasury or a great surplus.

The property tax is the elastic element in the model system; if mines are excluded from its provisions the elastic element will practically disappear in the typical mining jurisdictions where the value of the mines comprehends from 50 to 95 per cent of the value of all property.

We believe that mines should be taxed for revenue only and condemn the super taxation of mines on the one hand and on the other, exemption or under taxation. A classification of real estate for taxation opens the door

to exploitation of the numerically weaker elements in the population by the dominant elements. Witness, Minnesota. In this state agriculture is predominant. Under the constitutional amendment of 1907 the legislature decreed that real estate should be assessed for taxation as follows: Rural lands and farms 33⅓ per cent of cash value; urban property 40 per cent of cash value; mining property 50 per cent of cash value.

Why the legislature stopped at 33⅓ per cent on rural lands and farms is not apparent to us; nor do we find any reason why city property and mines should pay more taxes in proportion to value than rural property. On two occasions since 1907 the mines escaped additional super-taxation in the form of a production tax through the action of the governor in interposing his veto. The developments in Minnesota should be carefully pondered by those who would give into the hands of state legislatures the power of classification of real estate for taxation through constitutional amendment. The prevailing constitutional rule of uniformity so far as it applies to real estate is a wholesome restraint on the misuse of legislative power by a dominant element or class and in our opinion it should be carefully guarded in all proposed amendments which purpose only the exclusion of intangible and personal property from the application of this rule.

On the other hand it appears that in certain of the states where the mining element of the population is relatively much stronger numerically and politically than in Minnesota, legislative devices have been found to ease the tax burden on mines at the expense of other property. The root of the trouble in these states, as in Minnesota, is not to be ascribed entirely to human selfishness. Under the tax systems prevailing today in nearly all of the states, the burden falls with crushing weight on real estate and other visible property, mainly on real estate. It is partly because real estate is over taxed nearly everywhere that we find the owners of it arrayed class against class, as in Minnesota. This is one of the social results of the failure of the general property tax to spread the burden fairly and equitably. It is the outstanding merit of the model system that all able-to-pay elements of the population will be reached and fairly taxed.

This committee harbors no distinction in theory between the various forms of property taxation. We would depart from the rule of uniformity so far as considerations of expediency and practicality based on experience demand. The exemption of invisible or intangible property in the model system, while maintaining the tax on other property, is a concession to human weakness, insurmountable administrative as well as economic difficulties and other difficulties attaching to the political organization of a federal government. But there are no such insurmountable obstacles in the way of taxing mines as other real estate is taxed and we, therefore, believe that the rule of uniformity should govern. Subsidies on the one hand and penalties on the other administered to industry through the device of taxing is a dangerous perversion of the taxing power of the state.

It has been argued in certain state legislatures and in political campaigns in some states that the property tax on mines should inure to the local jurisdictions only, the state levying its tax on product or income. It may be observed that this plan has found support in some instances among those who desire supertaxation of mines, and in others among those who seek to ease the burden on mines at the expense of other property. It has also been supported by those who would abandon the property tax entirely for state purposes. Whatever the viewpoint from which this dual tax is supported, the plan is opposed, if not by design, certainly in its results, to the equalization of taxes on mines with those on other real estate and is, therefore, not commended. A second not less important reason for opposing this dual system is that the interest of the state in an equitable administration of the *ad valorem* tax on mines depends, obviously, largely on its participation in the revenue.

A Practical Method

We believe that *ad valorem* taxation of mines by state and local jurisdictions under direct administration by a state tax commission or tax commissioner is a thoroughly practical method of taxing mineral wealth. We are not unmindful of the difficulties besetting the administration of such a tax. If the assessments are made by township, city, and village assessors, it cannot be operated satisfactorily. But the model system contemplates a state tax commission or tax commissioner in every state with power of orginal assessment of certain property and presumably with power to maintain such expert assistance as may be necessary. Such a centralized administration is indispensable for a satisfactory administration of the *ad valorem* tax on mines. What has already been done under centralized administration in Michigan, Wisconsin, Minnesota, and Arizona, can be done in other states. We believe that those who ascribe the success of the system in these states to the character of the mines more than to central administrative control are misinformed. Every problem of assessment and administration that could conceivably arise anywhere occurs in principle in the application of the system in these states. They have all been satisfactorily met.

It is true that the appraisal of mining property, particularly certain types of mines and partially developed mineral deposits is impossible for the unskilled assessor and not easy for the trained expert. But the difficulties in these states have been overcome by systematic investigations and study carried on from year to year. In Minnesota there is a *liason* between the tax commission and the school of mines, in Wisconsin and Michigan between the tax commission and the geological survey. Into the hands of these experts is given complete operating records of the mines, mine maps and all other data in the hands of the mine operators. All of this is supplemented by examinations on the ground and friendly cooperation of the operators. Every consideration and evidence affecting values is explored and weighed. Confidence and good will govern the relations of the state officials and the operators.

A common objection to the *ad valorem* tax is that idle mines will be taxed. In our opinion they ought to be taxed if they are valuable. There is no more reason why idle mines should be relieved of taxes than non-productive property generally should be. If a mine is idle there is in the ordinary case a reason for it of a nature to depress the value far below what it would be were the property in operation, but so long as the mine has sale value, that value, should be the measure of its relative tax so long as other real estate is similarly treated.

Neither are we impressed with the often voiced opinion that *ad valorem* taxation for revenue only at the same level as other real estate restrains to a too serious extent the development of ore reserves in advance of current requirements and discourages exploration for and development of new mines. Mining development in Arizona has not been perceptibly repressed by the *ad valorem* tax. In Michigan, Wisconsin, and Minnesota, the reserves of iron ore now estimated at about 2,000,000,000 tons, or a 30 years' supply at the present rate of shipment, have been built up by exploration despite this tax. After all, the tax is merely an element of cost and will be reckoned with precisely as other costs are. The miner naturally will conduct his operations at the lowest possible cost, but if he neglects to develop his reserves in advance of needs of the moment his ultimate loss is bound to exceed many fold the saving in taxes. The experience in Michigan, Minnesota and Arizona warrants the dismissal of this objection.

It is often urged in favor of a tax on income or product that ore in the ground is taxed, under the *ad valorem* system, year after year until it is mined and sold so that the heaviest tax is paid by the mineral of least present value or that which is last mined. Of course, there is no pyramiding of the taxes on unmined mineral as an actual fact of accounting and financing. Obviously, all charges in excess of or advance of income are capitalized and taxes are no exception. Taxes, like operating costs, are chargeable against the income of the year and are so disposed of as a practical matter. It is true, of course, that taxes on idle mines may, in certain cases, amount to a formidable deferred charge against the unmined mineral, but in this we find no reason for the exemption of idle mines from taxation so long as other nonproductive property must be taxed. The income tax, the specific tax on product and the gross receipts tax, would, of course, relieve the idle mines. From the standpoint of the taxpayer, and from the administrative standpoint as well, the income tax is to be preferred to an *ad valorem* tax; the taxpayer would doubtless prefer event the tax on production or gross receipts if the rates are nominal and such taxes are admittedly easy to administer. But, as we have said, taxes such as these are not adapted to the local jurisdictions and are opposed, as a practical matter, to the principle of equalization of the taxes on mines and other real estate.

Summarizing the recommendations, your committee approves the principle of equalization of taxation of mines and other real estate, opposes the classification of real estate, including mines, for taxation at different levels, or by different methods, and advises the inclusion of the *ad valorem* system of mines taxation, under centralized state authority and control, in the model system of state and local taxation.

Exhibits Show Trend in Design

Many of the 225 Exhibits at the Foundry Display at Columbus Indicate New Developments in Model and Construction of Machine Tools, Molding Machines, Handling Equipment and Furnaces

WITH more than 235 firms represented and more than 75,000 square feet of floor space in seven spacious buildings devoted to a varied display of foundry, machine tool and wood and metal working machinery, the fifteenth annual exhibit of the American Foundrymen's association opened Monday morning at the Ohio State fair grounds, Columbus, O., under unusually favorable conditions. On account of the vast amount of floor space available it was not necessary to restrict the alloments to exhibitors, and this, together with the fact that no abnormal pressure of business is bearing upon manufacturers as was the case during the past few years, probably accounts for the record breaking size of the exhibit now in progress.

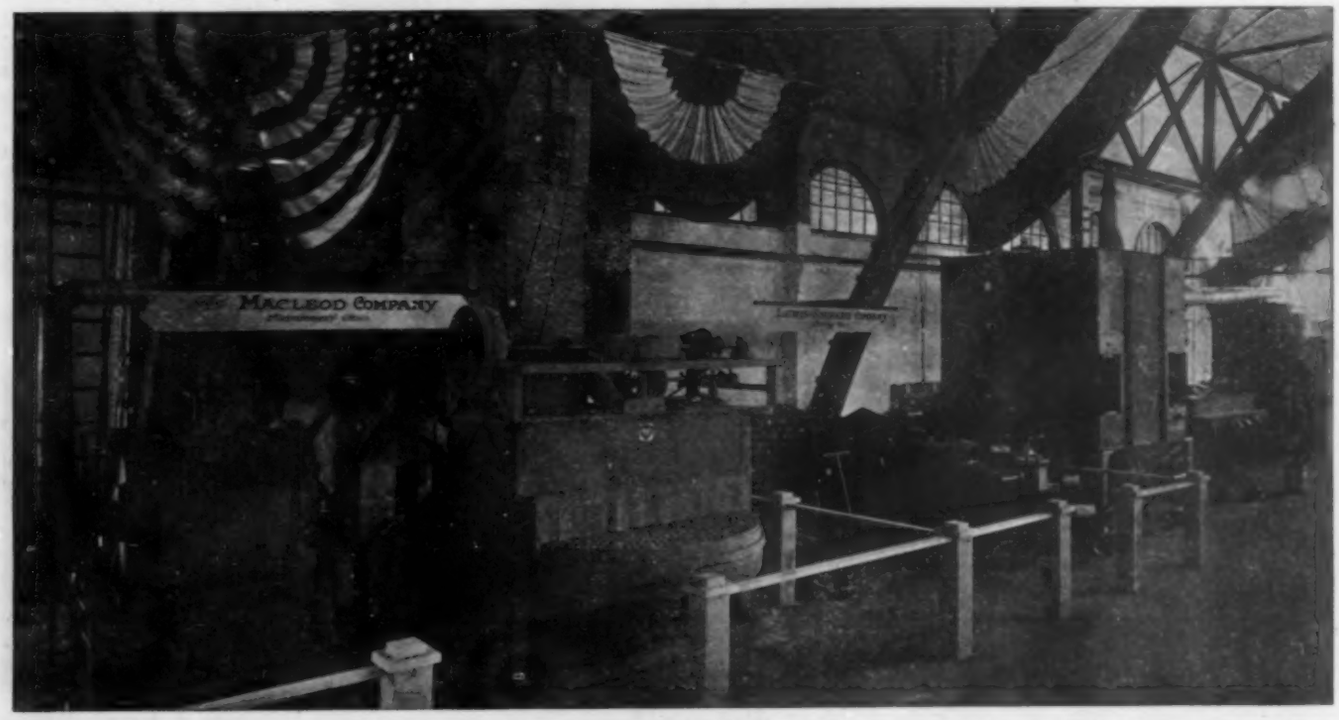
While it is difficult to point to abstract tendencies in the design of foundry equipment reflected by the displays at the show, there are indications that more attention is being given to the problems of handling material than heretofore. Tractors, conveyors, trolley systems, cranes and sand handling machinery form an important part of the exhibit. Electric furnaces, although not new to visitors of foundry shows, this year are displayed with complete wiring and accessories. Unusual prominence is given to electric melting furnaces for nonferrous metals.

New Developments in Tools

Although the most extensive displays of machine shop equipment are being made by machinery dealers, a number of manufacturers are exhibiting their products and showing by actual demonstration many improved features in the design and construction of their tools. The various exhibits reflect a tendency toward the elimination of certain shafts, gears and pulleys in driving mechanism, thus permitting a greater portion of the motor horsepower to be delivered to the spindle. In several machines, the elevating screw which controls the vertical movement of the work table is driven from the top instead of from the bottom, as in the conventional design of the past. An improvement in the method of chucking is indicated by the number of machines which are equipped to hold work by means of magnets, air or chuck jaws controlled by planetary gears.

Bakers Bros., Toledo, O., is exhibiting a two-spindle drill of new design. In this machine the elevating screw passes through the center of the table and is driven at the top by gears which may be thrown in mesh with a gear on the driving shaft. The thrust on the spindles is taken on ball bearings held in a race just above the drill socket. This company also exhibits a heavy duty boring and drilling machine. The Whitman & Barnes Mfg. Co., Akron, O., is demonstrating drills and reamers on this machine, and also is operating a drill grinding machine to indicate how drills should be ground.

A novel chucking device is being shown in connection with the exhibit of the Warner & Swasey Co., Cleveland. A universal, hollow hexagon turret lathe is being demonstrated on a two-step gear blank job and a double friction back geared turret lathe is being shown turning out cone gears. These machines are equipped with air chucks manufactured by the Frontier Chuck & Tool Co., Buffalo. Air at from 30 to 90 pounds pressure is admitted to a cylinder, forcing a wedge-pin attached to a piston against a lever which in turn operates the chuck jaw. When the air is released the jaws are returned to their normal positions by the pressure of a coil spring. The chucks fit any standard arbor and



SAND BLASTING MACHINERY IS PROVING TO BE A PROMINENT FEATURE OF THE EXHIBITION—MANY MANUFACTURERS ARE SHOWING THEIR MACHINES IN OPERATION

are self-contained except for the small air line connecting the chuck to the supply pipe. The Thomas Elevator Co., Chicago, is displaying a wrenchless chuck in which a planetary gear is employed.

Perhaps the most revolutionary machine tool shown at the convention is the new slotting machine of the milling type manufactured by the Racine Tool & Machine Co., Racine, Wis. In effect, this tool is an interior milling machine with a cutter somewhat resembling a broach. The cutter is held in a vertical position and is given a reciprocating motion by a crank disk operating a connecting rod. The length of the stroke is 7 inches. The feeding arrangement is such that the proper pressure on the tool is maintained throughout each stroke. The machine is designed for slotting, boarching or key-seating interior openings.

Among the five grinding machines being shown by the Heald Machine Co., Worcester, Mass., is a rotary surface grinder equipped with a horizontal magnetic chuck. A rectangular magnetic chuck, two internal grinders and a cylinder grinding machine are being demonstrated by this company. Grinding and polishing machinery is exhibited by the St. Louis Machine Tool Co., St. Louis. The Osborne & Sexton Machinery Co., Columbus, O., is displaying and in some cases demonstrating a milling machine made by the Kempsmith Mfg. Co., Milwaukee; a drill press by the Buckeye Drill & Lathe Co., Columbus, O.; grinders by Webster & Perks, Springfield, O.; a disk grinder by the Wonder Grinder Co., Erie, Pa.; a hack saw machine by the Peerless Machine Co., Racine, Wis.; a band saw and circular saw by the Crescent Machine Co., Leetonia, O.; and a lathe and shaper manufactured by the exhibitors.

The E. A. Kinsey Co., Cincinnati, machine tool dealer, is showing several machines, including a horizontal boring, drilling and milling machine manufactured by the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis. In this tool the work table is suspended from the top of the machine and the column is dovetailed to the bed. A heavy duty drill press, made by the Minster Drilling Machine Co., Minster, O., and equipped with a universal chuck, also is being shown. A semi-automatic lathe made by the R. K. LeBlond Co., Cincinnati, shown in this booth, has two carriages which can accommodate from four to 10 forming, turning or facing tools at a time. The carriages may be fed independently or in unison. A squaring shear made by the Streine Tool Co., New Bremen, O., and a cone pulley driven, plain milling machine built by the Brown & Sharpe Mfg. Co., Providence, R. I., complete this exhibit. The milling machine is equipped with a patented taper spindle nose and rapid table traverse. Steel and malleable castings are being straightened in the 50-ton, motor driven forcing press exhibited by the Lucas Machine Tool Co., Cleveland.

Metal sawing machinery is attracting much attention, probably because of the rapid strides made in the development of this type of equipment during the past few years. E. C. Atkins & Co., Indianapolis, is exhibiting a new hack saw machine. The Metal Saw & Machine Co., Inc., Springfield, Mass., is operating metal cutting band saws and the Black Diamond Saw & Machine Works, Natick, Mass., is exhibiting band and circular saw filing machines. The Armstrong-Blum Mfg. Co., Chicago, is showing sawing machines and a punching, shearing and bending machine. The manufacturers of circular saws are emphasizing the merits of various types of inserted-tooth saws. These saws are being demonstrated on machines built by the Higley Machine Co., New York, by the Simonds Mfg. Co., Fitchburg, Mass., and Henry Disston & Sons, Philadelphia. Complete lines of woodworking and pattern-making machinery are being shown by the American Woodworking Machinery Co., Rochester, N. Y., and the Oliver Machinery Co., Grand Rapids, Mich. This year's exhibits of these companies again reflect the ten-

THE EXHIBITS OF ELECTRIC FURNACES SHOW THE RAPID DEVELOPMENT BEING MADE IN THE APPLICATION OF THIS TYPE OF EQUIPMENT TO NONFERROUS MELTING

dency toward direct or closely connected electric motor drive for practically all woodworking tools. The simplicity of direct motor drive is particularly emphasized in the display of bench planers, jointers and saws exhibited by J. D. Wallace & Co., Chicago. Patternmakers' disk grinders are on display at the booths of the Charles H. Besly Co., Chicago, and a revolving knife wood trimmer is being shown by A. E. Bauer & Son, Chicago.

That close competition exists among the various types of melting furnaces is indicated by the large number of furnaces exhibited. Lower prices for crucibles has given an impetus to this method of melting and a number of exhibitors are displaying crucible melting furnaces. The Monarch Engineering & Mfg. Co., Baltimore, is showing such a furnace equipped for burning either oil or gas, which has the air intake so arranged that the air enters near the bottom of the steel casing and circulates around the furnace in a space between the lining and the shell. After being preheated by this operation the air enters the burner at the top of the furnace. This is said to produce an economy in fuel. Another interesting exhibit by this firm is a permanent mold machine for casting journal bearings. This machine has two cast-iron cores and a mold is made by moving a cast iron sectional mold up to the center core. Two such sections are in line with each core so that a mold can be made at each core and poured while the mold at the other side of the core is being stripped and cooling. The movable sections are operated by a single lever.

Both crucible and noncrucible furnaces are being exhibited by the Buckeye Products Co., Cincinnati. These furnaces are oil or gas burning and each furnace is equipped with a blower, thus being made an independent unit. This company also is displaying a new sand riddle. The novel feature of this riddle is a perforated cast-iron plate which is moved about against the screen and thus serves to break up all lumps of loam or sand.

The Campbell-Hausfeld Co., Harrison, O., has an interesting feature in its burners which are designed to burn either oil or gas, or a combination of oil and gas. This latter feature is of advantage when the gas supply is low as oil can then be used to supplement the gas.

A gas or oil burning furnace rotated by power is being exhibited by the United States Smelting Furnace Co., Belleville, Ill. This furnace tilts to pour from the end which has only a small opening. Charging is done through the end at which the flame enters after the burner is swung aside. This furnace melts 199 pounds of brass in about 30 minutes.

A large assortment of burners are being displayed by the Hauck Mfg. Co., Brooklyn, N. Y. A crucible furnace for brass or aluminum was equipped with a burner which operates with kerosene without any air compressor or fan. The oil is transformed into a vapor and burns with a blue flame. Similar burners are applied under small boilers, glue pots, small core ovens, etc.

The part electric furnaces are playing in melting steel and especially brass is indicated by the number of electric furnace companies which occupy booths. The Booth Electric Furnace Co., Chicago; the Detroit Electric Furnace Co., Detroit; the Electric Furnace Co., Alliance, O.; the Ludlum Steel Co., Watervliet, N. Y., and the Ajax Metal Co., Philadelphia, all are displaying furnaces.

A new model is shown by the Industrial Electric Furnace Co., Chicago. This is the Von Slegell repelling arc type furnace for melting either brass or steel. It operates directly on the power line without the use of transformers, thus saving the expense of extensive electrical equipment. The furnace exhibited has three 1-inch graphite electrodes which operate in a cylindrical graphite shell. This shell with the electrodes is lowered into the melting chamber as fast as the charge melts and subsides.

Endeavoring to convince foundrymen that counting castings by means of a scales is practical, the National Scales Co., Chicopee Falls, Mass., is exhibiting a number of scale counting machines. The largest of these has a capacity of 20,000 pounds. To use this style machine, one or more of the castings to be counted are placed in a receptacle which may be specially designed to suit different kinds of castings, and the castings to be counted are placed on the scales platform. The number of castings is then read direct on a beam.

Welding equipment is well represented by a number of firms, and besides the usual exhibit of this apparatus the Air Reduction Sales Co., New York, and the Torchweld Equipment Co., Chicago, are demonstrating the practice of cutting gray iron with the gas torch, explaining the process to visitors. Davis-Bournonville Co., Jersey City, N. J., is showing a specially designed torch for working in pockets in metal. A long neck on the tip enables it to reach in a casting for 6 inches and it is so designed that it will stay lighted when working at a red heat.

Many firms of designing and building engineers are occupying booths and exhibiting drawings and photographs of foundry buildings. Among these are the Austin Co., Cleveland; Frank D. Chase, Inc., Chicago; H. K. Ferguson Co., Cleveland; H. M. Lane Co., Detroit; David Lupton's Sons Co., Philadelphia, and Robinson, Dwight & Co., Buckhill Falls, Pa. These exhibits illustrate the recent advance in the

THE MANUFACTURERS OF PIG IRON AND COKE ARE DISPLAYING THEIR PRODUCTS ATTRACTIVELY—ANOTHER MANUFACTURER REPRODUCED THE STATE HOUSE AT COLUMBUS IN COKE

architecture of foundry buildings. The Austin Co., Cleveland, has erected a model of its standard type foundry building, characterized by an inverted roof. The adaptability of wood blocks to foundry floors is indicated in photographs displayed by Jennison-Wright Co., Toledo, O.

Blast-volume meters have not so far found a wide application in foundries but improvements are being made in their design which it is hoped will tend to make them more popular with the average foundryman. The Bacharach Industrial Instrument Co., Pittsburgh, is exhibiting a number of pressure volume gages, among which was an instrument which was so arranged that volume or pressure readings could be taken from three cupolas on the same instrument.

Among the interesting exhibits of molding equipment are two coremaking machines shown by the E. J. Woodison Co., Detroit. One of these is a new bench coremaking machine which can be bolted to any coremaking bench. The cradle will hold a core box any size up to and including 12 x 18 inches and having a draw up to 6 inches. The design has been so simplified that the machine can be operated by unskilled labor. The operator stands in one position throughout the entire process of making the core. From his bench he throws the sand into the corebox, jolts by hand, strikes off, pulls down a clamping device, after which he throws the cradle a quarter turn and the box is on the plate. He then pushes a button to start the vibrator, pushes down a lever until it automatically locks and the core is drawn.

A second machine has been designed for use with split core boxes which require to be drawn sideways. This machine will draw split cores up to 8 inches in depth; but the width and length of the core boxes may be of any reasonable dimensions. Two magnets placed horizontally against pads on the outside of the box vibrate and draw at the same time, while another magnet holds the core box firmly in place. The magnets slide on guides which insures a perfect draw. The rapping imparted by the vibrator is just sufficient to loosen the box but does not decrease the bulk of the core.

A comprehensive line of molding machines including direct draw roll over jolt machine; combination power jolt stripper squeezer large and small type; combination jolt strippers hand operated; plain air squeezers and jolt squeezers and small roll over machines are shown by the Osborn Mfg. Co., Cleveland. Interest centered in one of the booths where a newly designed machine for making soil pipe was shown in operation. The machine is of the jolt squeezer type and the flasks are designed to take two patterns side by side.

Henry E. Pridmore, Chicago, is showing six different types of molding machines in operation including a 30-inch combination jolt, roll over on which was mounted a cylinder pattern. This machine was served by a chain hoist suspended from an I-beam supported on suitable stands. The Grimes Molding Machine Co., Detroit, has several machines including a jar-ram, roll over machine of 1000 pounds lifting capacity and a hand ram roll over machine equipped with a rapidly operated pattern changing device. The exhibit of the Arcade Mfg. Co., Freeport, Ill., comprises eight different types of molding machines and also an installation showing the application of a patented pouring device. Among the seven molding machines shown by the Nicholls Co., Brooklyn, is one equipped with an electromagnetic drawing device. The Federal Malleable Co., West Allis, Wis., has three machines in operation on which are mounted unique patterns for soil pipe fittings. The Wadsworth Core Machine & Equipment Co., Akron, is exhibiting a coremaking machine and also a core cutting and coning machine as well as various sizes of steel core and bottom plates. The International Molding Machine Co., Chicago, has samples of molding machines on exhibition. The United States Molding Machine Co., Cleveland; American Molding Machine Co., Terre Haute, Ind.; Davenport Machine & Foundry Co., Davenport, Iowa; Berkshire Mfg. Co., Cleveland; R. J. Teetor Co., Muskegon, Mich.; Hanna Engineering Works, Chicago; the Federal Foundry Supply Co., Cleveland; also showed complete lines of molding machines.

An interesting exhibition of pattern plate making by means of a patented compound is being demonstrated at the booth of the Menefee Foundry Co., Inc., Fort Wayne, Ind.

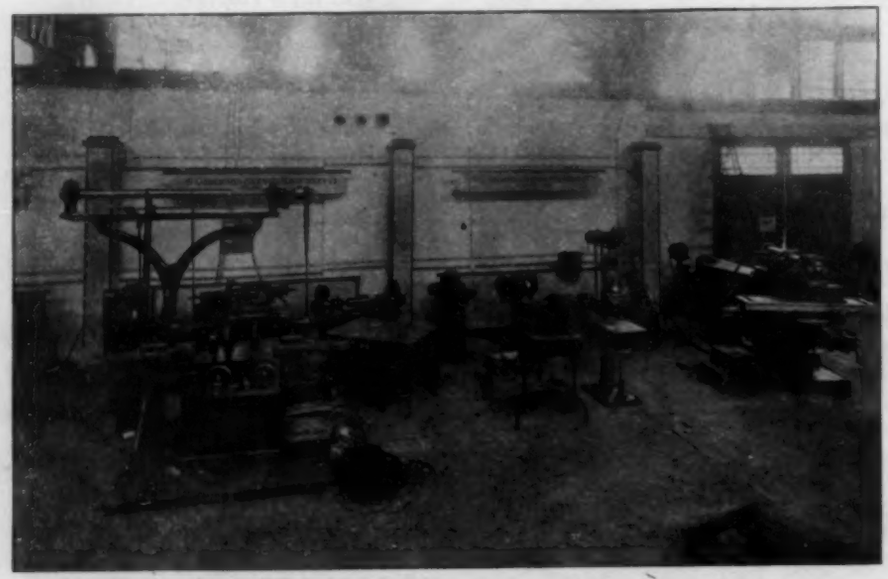
Displays Pneumatic Machinery

Complete lines of pneumatic foundry tools and also tools used in other lines of industry are shown by the Cleveland Pneumatic Tool Co., Cleveland; Black & Decker Mfg. Co., Baltimore; Chicago Pneumatic Tool Co., New York; Keller Pneumatic Tool Co., Chicago; George Oldham & Son Co., Baltimore; Dayton Pneumatic Tool Co., Dayton, O.; and the Independent Pneumatic Tool Co., Chicago.

Special educational devices worked out by the engineers of the Chicago Pneumatic Tool Co., make the exhibit the most complete and comprehensive ever displayed by the company. In addition to the tools the Cleveland Pneumatic Tool Co. has on display a complete line of pressure seated valves for air pipe lines and a complete line of air hose couplings.

The Curtis Pneumatic Machinery Co., St. Louis, is displaying a double cylinder, single-acting, water cooled air compressor. It is mounted on a base with electric motor and is equipped with automatic unloader. Two types of foundry cranes equipped with air hoist also are shown.

Other features of the exhibition are disk grinders made by the Gardner Machine Co., Beloit, Wis., including a special 53-inch disk grinder having an auxiliary feed attachment for supplying a constant stream of work to the disk; a conical mill for pulverizing brass ashes, etc., made by the Hardinge Co., New York; a ¼-size motor



A NUMBER OF MACHINE TOOL DEALERS ARE EXHIBITING THE PRODUCTS OF WELL KNOWN MACHINERY MANUFACTURERS—PRACTICALLY ALL OF BUILDING NO. 5 IS DEVOTED TO MACHINE TOOLS

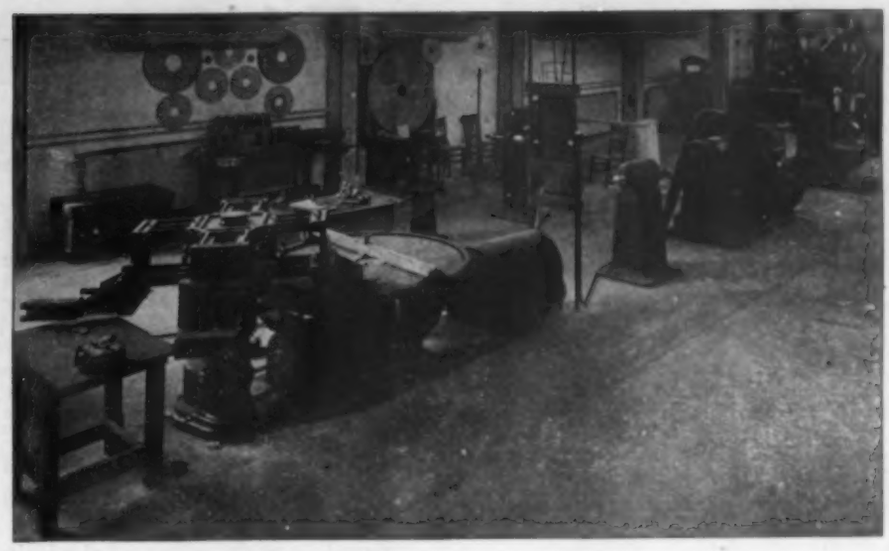
driven working model of a power hammer at the booth of Beaudry & Co., Boston, and air compressors, motor and steam driven and detail accessories at the booth of the Westinghouse Traction Brake Co., Pittsburgh.

Lift Trucks and Trailers

Eight exhibitors are displaying different forms of transportation equipment, battery and motor trucks, trailers, self dumping and hand and power dumping bodies; wheel barrows and double wheeled hand trucks. The list includes the Clark Tructractor Co., Chicago; Cowan Truck Co., Holyoke, Mass.; Automatic Transportation Co., Buffalo; Ohio Equipment Co., Cleveland; Barrett-Cravens Co., Chicago; Lakewood Engineering Co., Cleveland; Mercury Mfg. Co., Chicago; the Lew Shepard Co., Boston; and the Kilbourne & Jacobs Mfg. Co., Columbus.

The Columbus show excells all previous exhibitions in the display of operating sandblast and allied equipment. The Pangborn Co., Hagerstown, Md., has an operating exhibit where castings are cleaned. The Standard Equipment Co., New Haven, Conn., displays three sizes of its radial sand blast barrels, and in addition has a cinder mill which is in operation. The Hoevel Mfg. Corp., Jersey City, N. J., has a number of machines, and is showing with them a complete sandblast room, of the all-metal type. The S. Obermayer Co., Chicago, recently has taken over the sale of the tumbling barrel manufactured by the Ideal Machinery Co., Cincinnati. This is designed for small castings. A central chain belt, connected to a motor which is unit with the machine, turns the barrel and imparts the tumbling effect. A novel feature is introduced in the elevating skip, similar to that which is employed upon some types of sand mixers. This is driven from the same motor, and provides a ready means for dumping the entire charge of castings into the barrel at one time. The American Foundry Equipment Co. which recently was consolidated and became a part of the Whiting Corp., Harvey, Ill., is showing sandblast installations of the various classes, and further a cloth screen dust arrester for use with this equipment.

Milwaukee is prominently represented by two exhibits of machinery for reclaiming metal from waste materials. The Magnetic Mfg. Co., of that city, has two types of magnetic separators for iron and steel foundries. The Dings Magnetic Separator Co., also of Milwaukee, has three machines in operation. One is a type which has been found valuable in various foundries making castings from ferrous metals. It is in use in one malleable foundry for reclaiming iron from malleable slag after the latter material has been broken by passing it through a hammer mill. Another type is designed for handling finer material and is used in aluminum and brass foundries for reclaiming small particles of iron filings or borings. A cross belt is employed to remove the iron from the magnetic belt after the nonferrous material has been deposited. This machine also is used by abrasive manufacturers in removing ferrosilicon from the raw or semifinished materials used.



GRINDING MACHINES AND ABRASIVES, AS WELL AS PATTERNMAKING MACHINERY, RECEIVE MUCH ATTENTION AT THE SHOW

Much attention has been given to core oven equipment in the past year. Economy in fuel consumption and improvement in ventilating are the principal advances shown. The Young Bros. Co., Detroit, has on display a two-compartment rack type oven, in which gas is used in one side and electric resistance units furnish the heat in the other. Two fans connecting to ample exhaust fans serve to remove all fumes from the oven without permitting them to escape into the foundry. The W. W. Sly Mfg. Co., Clevelang, is showing a two-section oven, each side of which is provided with five drawers. A cantilever beam extending out in front of each section serves to support a rigid shaft attached beneath a trolley which operates upon this beam. The shaft is provided with a number of catches which engage slots in the various drawers as desired. In this manner no obstruction is necessary in front of the oven to provide means for pulling the drawers forward, and the trolley supported shaft serves to hold up the front of the drawer as it is drawn outward.

Developments in lifting and conveying equipment are demonstrated by photographs, models and full size installations. The Cheasapeake Iron Works, Baltimore, makes use of all three means for presenting its products, as does also the Hayward Co., New York; Link Belt Co., Chicago, and the Louden Machinery Co., Fairfield, Iowa.

An interesting exhibit, showing the evolution in cupola blowing, is offered by P. H. & F. M. Roots, Connersville, Ind., who have in their space the first blower built by the firm beside the present type of product. The Spencer Turbine Co., Hartford, Conn., has a turbo-compressor, directly connected to a 30-horsepower Westinghouse motor. The equipment was designed by the company for furnishing cupola blast.

Practical operating units provided by Ingersoll-Rand Co., New York, and Sullivan Machinery Co., Chicago, are utilized to provide compressed air for the air-operated exhibits in two of the buildings. These are both motor driven.

McLain's System, Inc., Milwaukee, has a striking exhibit of semisteel products. A recent application of Mr. McLain's investigations is shown in a number of hammers, hatchets and other small hardware specialties made from a cupola-melted iron containing from 15 to 50 per cent steel. These have been annealed, and samples of the metal are stated to have developed from 55,000 to 70,000 pounds per square inch tensile strength.

The Geist Mfg. Co., Atlantic City, N. J., is demonstrating a flat bed, gas fired preheater upon which castings are heated to the required temperature and if desired are welded without being removed.

Minimizes Effects of Strikes

Statistics Bureau of Labor Department Points Out that Production Increases After a Vacation, and that Figures Showing Monetary Losses Are Valueless—Public Suffers "Inconvenience" Mainly—Comments on Steel Strike

WASHINGTON, Oct. 5.—In a statement by the bureau of labor statistics of the department of labor, purporting to show that all estimates of the cost of strikes are valueless, the 1919 steel strike is cited as a typical example and the department's view of the monetary and time loss given. The statement is made that in the Pittsburgh district the strike was beneficial to production in that after their return the strikers were rested and increased their former production rate some 60 per cent.

The statement also reveals that the official total of strikes is 3374 for 1919, compared with 3337 for 1918, 4450 for 1917, and 3789 for 1916. The number of persons engaged in strikes in 1919 came close to 5,000,000 all told, the department having records showing 4,112,507 strikers went out in 2493 of the 3374 strikes. In reference to the difficulty in ascertaining with any degree of accuracy the number of men out the statement says:

"During the early part of the steel strike, union officials and employers gave out daily information in regard to its progress. On the first day of the strike, Sept. 22, the union leaders announced that 279,000 men were idle; the next day the number was given at 327,000; two days later as 340,000; and on Oct. 27 as 370,000. On the other hand, the employers denied that over 40 per cent of the above number actually went out. On Sept. 23, the second day of the strike, the officials at Waukegan, Ill., stated that 30 per cent of the men were at work, while union leaders said only 5 per cent; at Homestead the officials said that 75 per cent were at work and the union leaders said 25 per cent."

These differences, it is explained, are due to the fact that a few "key" employes may force many others out of work, and while employers will only report the number actually on strike, the union leaders will claim the total made workless. It is stated that "in the steel strike some employers closed their mills at the beginning of the strike and did not open them until the men were ready to return." The men thus turned away were included by the strike leaders among the strikers. In a strike the size of the one in the steel industry, it is claimed the cost of obtaining accurate figures is prohibitive. The report proceeds:

"The statement that 370,000 steel men were on strike is at best a very general estimate by the leader of the strikers, and the statement that not more than 40 per cent of that number actually struck is merely an estimate of the employers. Neither can be accepted as accurate. Nor should an average between the two be taken, for it may be that the figures of one side are more nearly correct than those of the other."

Referring to the cost of the steel strike and the difficulty of ascertaining the precise loss, the report states:

"According to the reports of the United States Steel Corp., the average wage for all employes, excluding the administrative and selling forces, was $5.33 a day in 1918 and $6.12 a day in 1919. At the time of the strike, $4.62 was reported as the lowest daily wage paid. It would thus appear, after multiplying the number of man-days lost, stated as between 2,000,000 and 4,000,000, by the wages received, that the cost of the steel strike was between $10,000,000 and $245,000,000, estimates honestly made on reports issued by the strikers and employers, but too far apart to have any value as statistics."

Sometimes, it is stated in the report, strikers obtain other employment temporarily. In the steel strike the man who left a $6.12 a day job in a mill and obtained one as a carpenter at $8 was money ahead.

"Most industries are seasonal to a certain extent," according to the report, "and when after a short strike the men return invigorated and rested as a result of their vacation, they will, in the course of the season, do as much work as they would have done had no strike occurred. Thus, it was reported Oct. 31, in the steel strike, that in the Pittsburgh district steel was being produced at a rate 60 per cent in excess of the amount produced just before the strike."

"In only rare instances," it is stated, "does the public, the innocent third party, suffer money loss. It suffers inconvenience mainly. Rarely is there any loss in related industries."

Where state police and extra watchmen are necessitated the monetary loss is even greater, the report claims. The conclusion is that "while it may be possible to get at the cost of a few small strikes, it does not seem that figures purporting to represent the cost of strikes in money have any value whatever."

Open Shop for Shipyards

Declaring that it is not their intention to fight union labor, but to "stop union domination of our shops," seven of the largest shipbuliding and ship repair plants of Mobile, Ala., have adopted the open shop policy. The companies signing the agreement include the Alabama Dry Dock & Shipbuilding Co., and the Home Industry Iron Works, two of the largest ship repair plants in the South. This action follows a recent strike at Mobile of machinists and affiliated trades for higher wages, which strike failed.

Radicalism Rampant in Britain, Says Williams

Whiting Williams, formerly director of personnel, Hydraulic Steel Co., Cleveland, has returned from England and Scotland where he spent several months among the workmen in the coal mining and iron and steel districts to learn what the British workmen are thinking about. Previously Mr. Williams devoted seven months to a similar study in the United States, and on both of his expeditions he actually worked with the men as one of them. He is narrating his experience in book and lecture form in the hope of stimulating constructive thought.

In England, Mr. Williams first found work in a colliery at Treorchy, in the Rhonda district of South Wales, "in the most bolshevistic mine in the most bolshevistic section." He attended radical meetings of the miners both on the surface and in the pit 900 feet below. He was there when the men went out on strike, although the great British coal strike still is in abeyance, and was in the midst of a riot during which the strikers smashed all the windows in the manager's house.

Then Mr. Williams went to Glasgow where he failed to obtain a job in the shipyards, at the docks or in the steel mills, as jobs were scarce. He proceeded to Middlesborough, Eng., where he waited around the gates and talked with other jobless.

"I found more radicalism in a week over there than I met with in the United States in seven months," he said on his return home. One reason for this, particularly in Scotland, he found was the bad housing situation. He attended the British Trade Unions congress at Porstmouth, where he met a number of prominent labor leaders. Trade union discipline in England he regards as much stronger than in the United States.

By-Products Slump

Solvent Naphtha and Naphthalene Hold Up Well, But Others Are Dull

New York, Oct. 4.—Were sizable orders available it is likely little better than $4.40 to $4.50, works, could be done by producers of sulphate of ammonia. The market is weak and prices are off nominally about 25 cents. Trading is most listless. Nitrate of soda has slumped steadily.

The rubber industry, normally the biggest consumer of benzol, is buying little of that product at present. As a result the benzol market shows little activity. However, new outlets for benzol which have been in the process of development in recent months, including the cotton seed oil refining industry and the dry cleaning business, are tending somewhat to bolster up trading. Prices so far remain steady at 35 to 40½c, f.o.b. works, for pure benzol, and 33c. to 38½c for 90 per cent benzol.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants

Pure benzol	$0.35 to .40½
Toluol	.35 to .40½
Solvent naphtha	.30 to .35½

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	nominal
Naphthalene, balls	nominal

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$4.40 to $4.50

Contract

Pure benzol	$0.35 to .40½
Toluol	.35 to .40½
Solvent naphtha	.30 to .35½

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	nominal
Naphthalene, balls	nominal

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	nominal

Demand for solvent naphtha is holding up well, the paint and varnish manufacturers still being active. This has kept producers well booked ahead, despite a slight improvement in production which now ranges around 70 per cent. Quotations on solvent naphtha continue at 30c to 35½c., f.o.b. works. Toluol is in little demand at 35 to 40½c., f.o.b. works.

The market on naphthalene is undoubtedly the strongest of any of t coal tar products. Producers are well sold up this year and consumers are active in trying to close on whatever nearby material is available. The market is firm at 16 to 20 cents, f.o.b. works, for spot and nearby shipment. The future market is nominal.

The United Alloy Steel Corp., Canton, O., has declared its regular quarterly dividend of $1 a share payable Oct. 15 to stock of record Oct. 15.

Obituaries

HENRY ARNOTT CHISHOLM, who until his retirement in November, 1919, was president of the Chisholm Shovel Co., Cleveland, died in Yokohama, Japan, Sept. 28, after a brief illness, while on a tour of the Orient, according to a cable received by his son, A. T. Chisholm, who has been president of the company for the past year.

Mr. Chisholm was born in Montreal, Canada, Nov. 18, 1851, and when three years old, his family moved to Cleveland, where in 1877, his father, William Chisholm, established the Chisholm Steel Shovel Works, in the control of which he remained until his death Jan. 10, 1907. Henry A. Chisholm received his early education in the public schools of Cleveland and later went to Exeter, N. H., where he prepared for college and was graduated from Harvard in 1874. He returned to Cleveland to enter the plant of the Cleveland Rolling Mills Co., and with his father in 1877 became interested in the shovel works. He was appointed manager and at his father's death the company was incorporated as the William Chisholm's Sons Co., with Henry A. Chisholm as president, a position retained by him when the name was changed to the Chisholm Shovel Co., until his retirement in 1919.

He also was a director of the Union Steel Screw Co., and later a director in the National Screw & Tack Co., which absorbed the Union company, negotiations for which merger largerly were conducted by Mr. Chisholm.

I. Fred Snow, a salesman and designing engineer for the Lapoint Machine Tool Co., Hudson, Mass., died at his home in that town, Sept. 24, aged 32 years.

George Gilbert Davis, Boston, treasurer of the Davis & Furber Machine Co., North Andover, Mass., died at his summer home in that city, Sept. 30, aged 76 years. After graduating from Harvard college in 1865 he became identified with his father in the company and served as president from 1892 to 1896. Since that time he had been treasurer.

Oliver Willcox Norton, a pioneer in the manufacture of tin cans, died Oct. 1 at his home in Chicago from the infirmities of advanced age. He was born in Allegheny county, N. Y., Dec. 17, 1839, and served through the Civil war. He was one of the founders of Norton & Fancher, Toledo, O. In 1870 the plant was moved to Maywood, a suburb of Chicago, and in 1872 the name was changed to Norton Bros. Mr. Norton had been blind for several years.

Francis J. Coffey, Indianapolis, representative of the Wickwire-Spencer Steel Corp., Worcester, Mass., was killed in an automobile accident in Indianapolis, Oct. 2. He was 33 years old, a native of Worcester, and was connected with the sales department of the Morgan Spring Co., Worcester, when he went to Indianapolis. Mr. Coffey was a lieutenant in the recent war and saw overseas service.

Charles H. Graham, formerly treasurer of the Upson Nut Co., Unionville, Conn., now the Upson works of the Bourne-Fuller Co., Cleveland, died at his home in Unionville, Oct. 1, aged 83. At the age of 18, Mr. Graham entered the employ of Dwight Longdon, who founded the business which later became the Upson Nut Co. He was promoted from a factory worker to shipper and then superintendent, which position he filled for 15 years. Upon the death of Samuel Frisbie, he was elected treasurer, holding the position until a few years ago, when he retired. He was also secretary of the Union Nut & Bolt Co., New York and Chicago and assistant treasurer of the Union Rolling Mill, Cleveland. Mr. Graham was of an inventive turn of mind and patented the automatic lathe for threading bolts.

William Henry Dietrich, who died suddenly of bright's disease and heart failure on Aug. 11, in Bombay, India, was resident engineer in that city for the United States Steel Product Co., 30 Church street, New York. He had been located in Bombay since January, 1920, having been transferred from Shanghai, China, where he had served that company as resident engineer after having had charge of erection of bridges for it in Peru. Prior to his United States Steel Products Co. connection, he had spent most of his professional career with the American Bridge Co. He was born near Waynesboro, Pa., in 1873, and attended the Mercersburg academy, Mercersburg, Pa., preparatory to entering Princeton university, from which he was graduated as a civil engineer in 1899. He later was an instructor at that university in the civil engineering department. He was an associate member of the American Society of Civil Engineers.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

AT A meeting of the stockholders of the Great Lakes Engineering Works, held at its main office, Shipyard, River Rouge, Mich., Sept. 24, the stockholders elected to adopt the old corporate name, Great Lakes Engineering Works, and named six directors, making the full directorate as follows: Antonio C. Pessano, John A. Ubsdell George B. Turnbull, Frederick G. Morley, C. Henry Hecker, T. W. Palmer Livingstone, Joseph Boyer Jr., all of Detroit; Isaac W. Frank, Pittsburgh, and John T. Webster, Cleveland. After the stockholders' meeting the directors convened and elected the following officers: Antonio C. Pessano, chairman, the board of directors; John A. Ubsdell, president and general manager; George B. Turnbull, vice president and assistant general manager; John T. Webster, vice president, and Frederick G. Morley, secretary and treasurer.

The following appointments have been made: Charles E. Baisley, manager River Rouge shipyard; Frank C. Pahlow, manager Ashtabula shipyard; Robert Jackson, manager Detroit engine works; Charles Short, secretary to the president.

Perhaps the most remarkable part of this company's recent reorganization is that the employes of the company, on their own initiative subscribed and paid for immediately in cash, over one-third of the entire capital stock which they were allowed to take at the exact cost price paid for the properties. The Great Lakes Engineering Works will continue, as heretofore, the business of designing, building and repairing shops.

* * *

THE Tower Motor Truck Co., of Greenville, Mich., has decided to increase its capital stock from $500,000 to $2,500,000. Production of 400 cars is contemplated for 1921, made possible by erection of a 2-story addition, 60 x 100 feet, now being completed.

* * *

THE Iron Trade Products Co., with headquarters in the Farmers Bank building, Pittsburgh, is acting as exclusive agent for the entire output of coal and coking coal from the properties formerly belonging to the Westmoreland Gas Coal Co., on the Pennsylvania railroad in Westmoreland county, Pennsylvania, and now belonging to J. L. Kendall. These properties are producing pool No. 61 gas coal and standard furnace and foundry coking coal.

* * *

ARTICLES of incorporation have been filed by the Indianapolis Steel Products Co., Indianapolis, with a capital stock of $100,000. The company will deal in steel building materials and plans to begin operations and to secure a site for its plant immediately. The directors are John L. Crawford, William M. Lewis and Wilson N. Cox.

* * *

ARRANGEMENTS have been completed by the Ward Tool & Forging Co., Latrobe, Pa., manufacturer of punches, dies, reamers, tools, forgings, etc., for representation in the state of Michigan and the northwestern section of Ohio, with John D. Scott, Inc., 1156 Penobscot building, Detroit, with whom is affiliated John E. Love.

* * *

AN INCORPORATION certificate was filed with the secretary of state, Connecticut, recently by the General Service Corp., of Waterbury, which with capital stock of $100,000, will deal in metal novelties and appliances. The incorporators are George E. Towle, Arthur Zimmerman and William F. McGinnis.

* * *

WORK is being rushed on the plant of the Louisville Sheet Steel Co., Louisville, O., and the company expects to start operations between Nov. 1 and 15. Dr. James Fraunfelter is president of this company which manufactures galvanized sheets and formed products; H. E. McCoy is vice president, and J. W. Lucas is secretary and treasurer.

* * *

THE Pittsburgh office of the Allegheny Steel & Tube Co., 34-40 West street, New York, has been reopened in the Century building instead of the McGee building. Just as soon as a satisfactory lease for warehouse space in Pittsburgh or Allegheny, Pa., can be obtained, the company's materials now stored at various points in and about Pittsburgh, will be concentrated therein. This warehouse eventually will be the company's main storage point and will be much larger than the one maintained at New York. The Pittsburgh office will be under the supervision and management of Frank J. Caldwell, formerly assistant purchasing agent of the Aetna Explosives Co., Pittsburgh, and formerly assistant purchasing agent of the Arthur Koppel Co., Pittsburgh. H. J. Imhoff, formerly of the Ohio Seamless Steel Tube Co., will assist Mr. Caldwell. Several weeks ago, the company opened its Chicago office, 80 East Jackson boulevard, under the direct management of Theodore L. Dodd.

* * *

THE Mountain States Machinery Co., 1710 Glenarm street, Denver, which handles such lines as products manufactured by the Crocker-Wheeler Co., the Maloney Electric Co., the Cutler-Hammer Mfg. Co., and the Terry Steam Turbine Co., has been appointed agent for the Roller-Smith Co., 233 Broadway, New York, manufacturer of electrical instruments, meters, circuit breakers, etc.

* * *

WHEN its organization is completed, the International Taximeter Corp., 239 West Sixty-ninth street, New York, formed recently by J. A. Costuma, will issue data and general layout of its machinery and equipment requirements. The company was formed to increase the facilities for the production of taximeters on a large scale, since up to the present the supply could not keep pace with the demand.

* * *

FOR the purpose of dealing in iron and steel scrap, metals and all grades of waste material, the Port Arthur Iron & Metal Co., Inc., Port Arthur, Tex., recently was incorporated. It may build warehouses in the near future and while it is not prepared to state what equipment will be purchased, it will likely be in the market for two or more shears, an acetylene generator, torch, etc. The officers are: President, H. M. Rosen, who was connected with the Rosen Iron & Metal Co., Dallas, Tex.; vice president, L. Diamond of the Diamond Junk Co., Port Arthur; and secretary-treasurer, Alex K. Karchmer of the Union Iron & Metal Co., Sherman, Tex.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

LOCATED at 470 Tolland street, East Hartford, Conn., the new factory of the A. F. Way Co. now is practically completed and is producing machine tools, dies, etc. The company removed to this address from Hartford, having come to Hartford from Westfield, Mass., three years ago. The new plant was financed by the East Hartford chamber of commerce development company, organized to promote industrial growth. It is 55 x 130 feet and has approximately 10,000 square feet of floor space. The front portion is devoted to the office headquarters, and in the rear are garages. There are two work bays on each side of the assembling floor. A crane travels over the entire length of this floor, which is equipped with modern machinery. J. T. Way is president; William C. Loren, vice president; A. F. Way, secretary and treasurer; Charles E. Jacobson, of South Manchester, is superintendent, and Charles Trewhelta, East Hartford, is factory foreman.

* * *

PRESENT equipment will take care of requirements of the Lima Sheet Metal Products Co., 308 East Wayne street, Lima, O., for some time, the recent increase in capital stock serving only to provide funds for a new building to give more room for manufacturing operations in connection with fenders, hoods and sheet metal parts for trucks and automobiles. The company is producing the greater part of the small tools it requires.

* * *

FUNDS for expansion were obtained by the American Welding & Mfg. Co., Warren, O., in increasing its capital stock recently. It is enlarging its plant and has been purchasing machinery to manufacture steel tubing up to 3 inches outside diameter, 14 gage and lighter. Several punch presses and electrical equipment such as motors, etc., remain to be purchased. It also intends to manufacture formed tubular parts for the automotive, bicycle and motorcycle industries. J. C. Manternach is president.

* * *

INCORPORATED at $100,000, the Standard Iron & Steel Co., New Haven, Conn., will branch out into a general warehouse business in iron and steel products. The new warehouse where the principle office of the company is located is 146 Winchester avenue, New Haven. The officers of the company, which is endeavoring to make connections with several mills producing steel sheets, tubing and cold rolled steel bars, are as follows: President, treasurer and general manager, Morris M. Levine; vice president and sales manager, I. H. Levine; and secretary, John Elliott.

* * *

SIX units are being erected at Valparaiso, Ind., as a new plant for the Pioneer Truck Co., 438-48 West Madison street, Chicago. Each will be 100 x 300 feet when completed, the building will be 300 feet wide x 600 feet long with separate power and heating plant. The company will equip a 100 x 300-foot machine shop, an assembly room, a test room, storage and shipping rooms, which will make possible a capacity output of 100 trucks daily. Plans now being completed will give the company 180,000 square feet of floor space on one floor. Architects are Ronneberg, Pierce & Hauber.

* * *

CAPITALIZED at $112,500, the Square Tool Corp., Peoria, Ill., now is perfecting its organization. It will be several weeks before it starts its new factory for the manufacture of tools and forgings but it will require a general line of machine shop equipment, hammers, etc. The temporary address of the company is 2409 North Adams street, Peoria, and its officers follow: C. H. Schmidgall, president; F. W. Sommer, vice president; Albert Addison, treasurer; and F. G. Lindeburg, secretary. The first three together with Albert Triebel, Dale Morgan, William Shannemeyer and Logan Richart comprise the board of directors.

* * *

THE Menominee Motor Truck Co., Clintonville, Wis., a reorganization of the old Menominee Motor Truck Co. of Menominee, Mich., has started work in its new plant at Clintonville, which represents an investment of about $175,000 in buildings and equipment. The output for the present will be 50 trucks per month, which is to be increased gradually to 100 per month, the existing capacity. The company is now owned and controlled by interests identified with the Four Wheel Drive Auto Co. of Clintonville, and the product will be marketed through identical channels. The Menominee company is capitalized at $500,000. James A. Bell is vice president and general manager.

* * *

FINISHING touches are now being put on the metal furniture and motor truck and tractor buildings, which are being erected by the Van Dorn Iron Works Co., at Ewald and Grand avenues, S. E., Cleveland, as new units of its plant. The tractor building containing 83,000 square feet of floor space, adjoins the metal furniture unit which approximates 128,000 square feet. The former is 120 x 265 feet while the latter's dimensions are 180 x 240. The construction is of brick and steel with steel sash, and wood floors, except for the first, which is of wood block.

* * *

FORMED to produce automobile headlight glare removers, the Auto Glare Remover Co., Inc., 161 Massachusetts avenue, Boston, has a capital of $100,000, of which $25,000 in 8 per cent preferred stock and $50,000 common stock has been authorized. The company plans to begin the manufacture of this automobile accessory immediately at the plants of the Peter Gray & Sons, Inc. Cambridge, Mass., and negotiations are near completion for an assembling plant in or near Boston. William W. O'Neill is president and general manager; Virgil A. Charles, formerly automobile insurance adjuster and at one time affiliated with the Interstate Corp., and the Briscoe Motors Co., is vice president; Harry Eisner, president of the Eisner-Lenk Co., Boston and treasurer of the Furber Mfg. Corp., Lynn, Mass., is treasurer; James A. Sweeney, formerly truck master for the United States government at Harrisburg, Pa., is sales manager and director. David Mitchell Lee, William Schak, Dr. Lucius Carpenter, and Garrett J. Barry are the other directors.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

MAJ. R. A. BULL, who recently resigned from the Duquesne Steel Casting Co., Coraopolis, Pa., of which he was vice president, has been employed by a group of six steel casting manufacturers in the capacity of consulting metallurgist and for the primary purpose of developing and perfecting higher standards in the production of steel castings in the foundries operated by these manufacturers. The members of this group of steel casting producers are as follows: Electric Steel Co., Chicago; Fort Pitt Steel Casting Co., McKeesport, Pa.; Isaac G. Johnson & Co., Spuyten Duyvil, N. Y.; Lebanon Steel Foundry, Lebanon, Pa.; Michigan Steel Castings Co., Detroit; and Sivyer Steel Castings Co., Milwaukee.

Major Bull has an international reputation as an authority in metallurgy and foundry practice as applied to steel casting manufacture. Prior to his affiliation with the Duquesne Steel Foundry Co., Major Bull was manager of the steel foundry of the Commonwealth Steel Co., Granite City, Pa. His activity in the steel foundry industry covers a period of more than 20 years and he has served in various capacities such as chemist, superintendent, manager, etc. His headquarters will be established at Sewickley, Pa. In the world war Major Bull was attached to the ordnance department and served overseas about a year. He is a member of a number of technical societies and he has been unusually active in the affairs of the American Foundrymen's association, of which he has been a director since 1911, and he served two years as its president in 1916 and 1917.

J. E. Lewis, vice president of the Harbison-Walker Refractories Co., has been elected a director of the Farmers Deposit National bank, Pittsburgh.

F. L. Stevenson has been named manager of the warehouse established at 1104 Prospect avenue, Cleveland, by the Colonial Steel Co., Pittsburgh.

C. C. Gray has severed his connections with Farrar Advertising Co. to become manager of sales for the Pannier Brothers Stamp Co., Pittsburgh.

W. D. Norman has resigned his connection with the Standard Steel Works Co., Morris building, Philadelphia, to become identified with the Colonial Iron Co., Singer building, New York.

Gilbert M. Tinney has been elected a director of the William B. Pollock Co., Youngstown, O., to fill the vacancy caused by the death of Charles W. McClure.

Le Roy Richards, now is affiliated with the sales department of the Alan Wood Iron & Steel Co., Philadelphia. For some time he was Philadelphia manager for the Nagle Steel Co., Pottstown, Pa.

P. N. Bowers recently became

MAJ. R. A. BULL

affiliated with Perry, Buxton & Doane Co., Pennsylvania building, Philadelphia, iron and steel scrap. He was formerly in the iron and steel brokerage business in Lancaster, Pa.

Prof. H. M. Boylston, formerly teacher at Harvard and Columbia universities, has been elected professor of metallurgy and head of the mining department at Case School of Applied Science, Cleveland. Professor Boylston was graduated from Harvard in 1903. He took his master's degree in metallurgy at Harvard in 1905. The next year he was private technical assistant to Prof. Henry M. Howe, Columbia university. Then for six years he taught metallurgy and metallography at Harvard under Prof. Albert Sauveur. In 1915 Professor Boylston was awarded the Carnegie research scholarship by the British Iron and Steel institute. Professor Boylston retains his connection with Sarbeur and Boylston, Abbott building, Cambridge, Mass., metallurgical engineers.

David B. Carson has resigned as district sales agent in Pittsburgh of the Carbon Steel Co. to become district manager of sales for the Tacony Steel Co., with offices in the Swetland building, Cleveland.

A. A. Loeffler recently was appointed by the Doehler Die-Casting Co., Brooklyn, N. Y., as its Detroit representative, succeeding F. C. Seeger, who will now represent the company on the Pacific coast, with headquarters in San Francisco.

Harold G. Foote, who was sales manager of the Illinois Steel Warehouse Co., St. Louis, for about 10 years, and who resigned on Aug. 1, now is manager of sales of the new warehouse of the Jones & Laughlin Steel Co., Pittsburgh.

Huntington Downer, formerly head of the bar department in the general sales office of the Lackawanna Steel Co., Buffalo, has been appointed Philadelphia district sales manager to succeed William Breeden, recently appointed to assume charge of sales in the Buffalo office under H. H. Barbour.

Frank J. Lanahan, president of the Fort Pitt Malleable Iron Co., was nominated to be president of the Railway Club of Pittsburgh at its meeting last Thursday night, and J. F. Townsend, traffic manager of the National Tube Co., and E. C. Sattley, salesmanager of the Page Steel & Wire Co., were nominated to be members of the finance committee.

John A. Bastian, for several years a forester in the state of Pennsylvania in the Mt. Union district, has been appointed forester for the Rock Hill Coal & Iron Co., Robertsdale, Huntingdon county. He is the first forester to be named by this company since the start of the co-operation with the state in regard to fire protection and will have supervision over 20,000 acres.

Men of the Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

EDWARD GROSSMAN, who as announced in the Sept. 23 issue of The Iron Trade Review, recently became sales manager of the T. P. Walls Tool & Supply Co. Inc., 25 Leonard street, New York, has been elected its treasurer and general manager. Mr. Grossman formerly was connected with the Fairbanks Co., New York, for a number of years as well as other supply houses. The Walls company manufacturers grinding, polishing and sanding machines and serves as manufacturers' agent for grinding wheels, taps, dies, milling cutters, etc.

L. W. Cash resigned as purchasing agent of the Defiance Motor Truck Co., Defiance, O., on Oct. 1.

Chales H. Smith, formerly with the R. D. Nutall Co., recently became sales manager of the Allegheny Gear Works, Pittsburgh.

Henry A. Powis recently became sales representative at Chicago for the Betts Machine Co. Inc., Rochester, N. Y.

James Hartness, president of the Jones & Lamson Machine Co., Springfield, Vt., has been nominated by the Republicans as a candidate for governor of that state.

Charles G. Bancroft, president of the International Trust Co., Boston has been elected a director of the United Shoe Machinery Corp of that city to fill a vacancy.

James A. Carr, Richmond, Ind., formerly president of the American Seeding Machine Co., Springfield, O., recently was elected chairman of the board.

Charles E. Sanders, who recently resigned as secretary of the Parker Wire Goods Co., Worcester, Mass., now is associated with the Bay State Truck Co., that city.

B. J. Yungbluth has been appointed supervisor of purchasing and supplies in charge of the purchasing, supplies and printing deartments, for the Philadelphia Rapid Transit Co., Philadelphia.

H. Bristol, 5 Columbus Circle, New York, has been designated representative of the Fafnir Bearing Co., New Britain, Conn., in New York state, where $100,000 capital is to be employed.

John W. Harrington of the Harrrington & Richardson Arms Co., Worcester, Mass., sailed from New York, Sept. 21, for a six weeks' European trip, with London and Paris as his objectives. He will combine business and pleasure.

Harry G. Stoddard, vice president and general manager of the Wyman-Gordon Co., Worcester, Mass., is seriously ill with pneumonia at his home. A consultation of physicians was held Friday and they expressed hope.

A. E. Murdock, who for the past 18 months has been tool room foreman of the Elmwood branch, Hartford, Conn., of the New Departure Mfg. Co., Bristol, Conn., has been appointed assistant manager.

A. W. Frank, formerly with the Sherwin-Williams Co., Cleveland, has been elected treasurer and director of the Standard Equipment Co., West 100th street, that city, maker of gears and other automobile parts.

R. B. Bennett, formerly with the Standard Steel & Bearings, Inc., Plainville, Conn., has gone to Toronto to take charge as mechanical superintendent of the Canadian General Electric Works.

George N. Jeppson, secretary and works manager of the Norton Co., Worcester, Mass., sailed from New York, Sept. 24 for a two months trip to France, Germany and England. He will visit the branch plants of the company in these three countries.

T. J. Davis, who formerly represented the Union Twist Drill Co., Athol, Mass., in the west, recently became affiliated with the W. L. Romaine Machinery Co., Milwaukee, as manager of the tool and equipment department.

Seymour de B Keimfi sales manager of Rolls-Royce of America, Inc., Springfield, Mass., who has just returned from a trip to England and France, says the Derby, Eng., works are so busy they cannot book an order for delivery before April, 1922.

Edmund A. Orrell of the sales department of the Graton & Knight Mfg. Co., Worcester, Mass., has sailed for Shanghai for a two years trip in the interests of the company. He will make his headquarters in Hong Kong.

E. Allen Moore, president of the Stanley Works, New Britain, Conn., has returned from a three months' trip abroad. He visited eight countries, including Germany, principally for the purpose of studying business conditions.

F. J. Weigle, who has been associated with the advertising department of the Mesta Machine Co., Pittsburgh, has resigned to become associated with the publicity department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and has been succeeded by W. L. Ingersoll.

Joseph G. Tew, Phenix, R. I., who has resigned as supervisor of mechanical training at the Taft-Peirce Mfg. Co., Woonsocket, R. I., builder of special machinery, has gone to Manhattan, Kans., as assistant professor in mechanical training at the Kansas State college.

H. Leonard Richardson, a mechanical engineer, for the past four years connected with the wire rope department of the North Works of the American Steel & Wire Co., Worcester, Mass., has been transferred as resident wire rope engineer at the Birmingham, Ala., works of the company.

Ralph B. Dibble, formerly advertising manager for the Graton & Knight Mfg. Co., Worcester, Mass., now is advertising manager for the Marmon Motor Car Co. in Boston. His successor is C. G. Bigelow, who is now editor of the *GraKnight Bulletin*, the monthly publication of the company.

H. W. Hutchinson of Winnipeg who has been elected a director of the Cockshutt Plow Co., Brantford, Ont., is well known in western business circles but has also been associated with a number of eastern Canadian industrial and financial enterprises. He is vice president of the Sawyer-Massey Ltd., Hamilton, a director of the Dominion bank, and president of the Consolidated Mortgage Co., Winnipeg Trust & Mortgage Co., Mortgage Investors Co. and other companies.

August Exports and Imports Gain

Foreign Buyers of American Iron and Steel Receive Second Highest Shipment Since November, 1918, while Domestic Consumers Take Largest Tonnage of Incoming Tonnage in Years—Ore Importations Are Heavy

IRON and steel exports in August this year totaled 431,519 tons, the largest monthly volume with one exception since November, 1918, the month in which the world war virtually came to an end. June, last year, exceeded August by more than 131,000 tons but the August exports, coming in a period when domestic deliveries of iron and steel were sorely handicapped by inadequate transportation facilities, shows to an extent the world demand for American furnace and mill products.

Imports of iron and steel, on the other hand, showed an even more remarkable growth, reaching 58,335 tons, the largest incoming tonnage of any month for several years back. Government statistics, from which these figures are taken, do not give the sources of the imported material but disclose the increased volume is due almost entirely to the larger deliveries here of foreign pig iron, semifinished steel and steel rails.

Exports in August were 35,000 tons heavier than in August last year, although the total for the eight months' periods ending with those calendar divisions indicate the aggregate last year, 3,141,558 tons, is some 9000 tons more than so far this year. In August this year scrap gained 33,500 tons over last, wire rods increased 3000 tons, tin and terne plate 7000 tons, rails 8000 tons, structural shapes 4000, plates 11,000, wire nails 2000 and pipes and fittings 7000. On the other hand, exports of pig iron lost 14,000 tons, semifinished material 15,000 tons, sheet 2000 tons, and all wire other than barbed 6000 tons. There were gains or losses in other materials, as shown in the accompanying table, but these were measured in hundred rather than thousand tons.

The August exports compare with 419,230 tons in July and 392,780 tons in June, a steady increase despite home troubles with the railroads. May was practically on a par with July, and April with June while March, with 426,448 tons, ranks next to August for the year's largest shipments. Until the August tonnage was exported, March also enjoyed the distinction of being the month with the greatest export volume, June, 1919, excepted, since the armistice month of 1918.

Pig iron imports in August totaled 21,514 tons, as compared with 11,848 in July and 5101 in August last year. Imports of iron ore jumped from 32,117 tons in August last year and 28,846 tons in July this year to 174,169 tons. This was due chiefly to shipments of 157,130 tons being received from Cuba. Importations of various ores and ferro alloys in August also amounted to considerable tonnage.

IMPORTS AND EXPORTS
(Gross Tons)

	1920		1919	
	Imports	Exports	Imports	Exports
January	45,795	333,677	16,932	370,876
February	36,491	308,128	11,819	340,623
March	38,377	426,448	17,750	367,314
April	29,681	395,583	16,561	402,653
May	29,125	419,064	18,636	414,029
June	40,549	392,780	21,761	502,954
July	32,742	419,230	28,258	287,685
August	58,325	431,519	28,990	396,112
September			43,567	363,531
October			40,698	302,459
November			43,826	336,994
December			39,806	254,780
Total	311,095	3,126,429	328,604	4,400,014

	1918		1917	
	Imports	Exports	Imports	Exports
January	12,475	490,259	40,910	608,281
February	12,940	432,465	24,947	449,099
March	14,312	380,062	37,943	606,558
April	11,247	463,035	48,561	517,783
May	14,387	488,515	26,479	582,303
June	13,913	418,178	29,080	629,305
July	11,789	457,118	28,859	346,393
August	12,862	511,782	26,129	503,075
September	9,013	473,126	19,058	499,067
October	15,552	426,458	14,310	571,868
November	11,329	439,268	15,559	497,977
December	28,445	357,753	14,642	653,344
Total	168,264	5,338,019	326,477	6,465,053

IRON AND STEEL EXPORTS
(Gross Tons)

	August		8 Months ending August	
	1920	1919	1920	1919
Pig iron	22,645	36,071	152,880	252,121
Scrap	37,573	4,019	121,594	11,904
Steel billets ing. & bl'ms	20,920	36,162	176,450	165,449
Wire rods	12,987	9,620	90,566	87,105
Steel rails	56,160	48,595	389,963	461,804
Steel bars	54,340	54,260	417,605	381,379
Iron bars	3,566	4,143	25,953	49,320
Struc. iron and steel	36,603	32,943	273,298	273,664
Hoops, bands & scroll	2,613	3,638	34,518	2820,3
Galvanize . sheets and plates	10,218	9,875	74,049	71,336
Iron sheets and plates	1,781	2,708	19,438	27,182
Steel plates	65,765	54,625	560,238	505,022
Steel sheets	12,720	14,132	104,976	128,922
Ship and tank plates, punched and shaped	3,317	2,466	28,685	9,081
Tin and terne plate	16,468	9,250	156,454	141,428
Barbed wire	7,999	9,487	80,145	61,398
All oth. wire	15,549	21,687	109,800	136,953
Cut nails	468	84	1,765	2,332
Wire nails	10,196	7,781	54,144	68,901
All other nails incl. tacks	705	866	7,239	12,967
Pipes and fit'gs	34,035	27,482	209,962	200,616
R. R. spikes	1,205	1,790	10,999	19,590
Bolts, nuts, rivets	2,766	3,226	25,054	29,862
Horseshoes	245	663	1,385	2,793
Cast Radiators	675	539	4,960	2,407
Total	431,519	396,112	3,132,120	3,141,558

IRON AND STEEL IMPORTS
(Gross Tons)

	August		8 Months ending August	
	1920	1919	1920	1919
Pig iron	21,514	5,101	140,048	36,109
Scrap	24,714	22,336	110,386	101,329
Bar iron	1,198	156	3,666	1,043
Ingots, blooms and billets	1,204	329	20,976	5,673
Structural shapes	183	16	1,024	709
Rails	5,549	968	35,501	14,639
Sheets and plates	273	36	1,176	704
Tin and terne plate	49	27	271	131
Wire rods	651	21	2,622	120
Total	58,335	28,990	315,670	160,547

IMPORTS VARIOUS ORES AND FERROALLOYS
(Gross Tons)

	August		8 Months ending August	
	1920	1919	1920	1919
Ferromanganese	9,504	601	33,515	16,994
Ferrosilicon	1,048	1,598	10,484	4,619
Manganese ore	99,601	8,240	334,590	249,810
Tungsten-bearing ore	131	553	1,012	5,025
Nickel ore	3,260	1,415	23,525	14,422
Total	113,844	12,407	403,126	290,870

EXPORTS PIG IRON AND SEMIFINISHED
(Gross Tons)

	1920		1919	
	Pig iron	Semi-finished material	Pig iron	Semi-finished material
January	18,468	19,937	36,757	11,594
February	15,689	22,693	20,925	9,900
March	22,815	30,444	22,158	8,176
April	14,608	19,032	17,038	11,488
May	13,032	16,370	37,087	20,771
June	17,105	29,811	39,785	46,016
July	29,647	17,243	42,327	21,318
August	22,645	20,920	36,071	36,162
September			18,991	37,513
October			14,108	20,713
November			21,429	13,211
December			14,612	21,538
Total	153,989	176,450	321,261	258,400

IRON ORE IMPORTS
(Gross Tons)

From	August		8 Months ending August	
	1920	1919	1920	1919
Spain	———	6,200	44,421	54,937
Sweden	———	14,015	20,812	48,823
Canada	3,238	616	26,568	9,376
Cuba	157,130	11,286	630,275	140,872
Other countries	13,801	.....	74,927	702
Total	174,169	32,117	797,003	254,710

September Machinery Trade Dull

Movement of Machine Tools Sluggish, Although Considerable New Inquiry Noted—Railroads Still the Backbone of Market Despite Much Holding Off on Buying—Automotive Industries Quiet—Crane Market Listless

CLEARING of the industrial atmosphere is awaited by machine tool users, dealers and manufacturers. This waiting attitude made itself manifest in September by sporadic inquiries and desultory buying. Considerable orders, however, apparently were withheld by different interests and this chiefly was true of the railroads. The issuance of several sizable lists at various times during the month served to rescue the market from the stagnation point which threatened. On the whole, however, September was a dull month as regards buying, although considerable inquiry was noted, most of which was new. Curtailment of production which preceeded the sweeping price-cutting movement on the part of the automotive industry, together with the fact that many machinery users expect machine tool manufacturers to follow suit, deprived sellers of much promised business. Cancellations were somewhat reduced in September as compared with August, but several cases were reported where manufacturers asked that deliveries be held up until after the first of next year. Improvement in deliveries was simultaneous with a betterment of the transportation situation and the settlement of the Cincinnati machinist strike, enabled the numerous makers there to promise increasingly improved deliveries of their products, although the situation so far leaves much to be desired.

High Lights Again Furnished by the Railroads

AS HAS been the case for the past two months, the railroads continued to furnish the market's features during September. Notwithstanding some sizable purchases, however, numerous lists shrunk considerably from their original size, and others which were scheduled to appear, have not developed. Announcements continue to be made by the different transportation interests that these are likely not to come out until next year. The Pennsylvania made some purchases on inquiries issued in the West but for lines east this road has withheld action. The Seaboard Air Line railroad abandoned plans to issue a large list this year and the Illinois Central decided not to award its large list issued in August. The New York Central, Cleveland, did not issue its long expected list. On its list of 48 or 50 machines, the Chicago & Northwestern made a few purchases both in the eastern and western markets and September purchases by the Santa Fe are said to aggregate over $50,000. The Union Pacific closed on approximately $80,000 worth and the Norfolk & Southern bought close to $50,000 worth. Canada reported steadily improving conditions in connection with the railroads and considerable business is expected soon. The Canadian National railways issued a generous list for the Maritime Province shops and the Grand Trunk's inquiry is said to represent an expenditure of over $200,000 for between 40 and 50 machines for its five shops.

New Inquiries Indicate Possible Buying Movement

MISCELLANEOUS industries continued to take their quota of machines in September and since closing action was withheld on numerous issued lists, some heavy buying is expected in October. Three sizable lists were featured during the month: First, one covering 125 machines for the National Lamp Works, Cleveland; second, a $100,000 list of miscellaneous machinery wanted by the Norfolk Construction & Marine Repair Corp., Norfolk, Va., and third, a list of over 100 tools for the General Electric Co., Schenectady, N. Y., Bridgeport, Conn., Bloomfield, N. J., and Philadelphia. A larger list for the last mentioned plant is expected soon. The Jones Oil Engine Co., Syracuse, N. Y., entered the market for 30 or 40 machines, while the list of the Safety Car Heating & Lighting Co., New York, covered 20 or 30. Lists of miscellaneous equipment were issued by the N. E. Seymour Mfg. Co., Milwaukee; the Square Tool Corp., Peoria, Ill.; Allen-Diffenbaugh Wrench & Tool Co., Baraboo, Wis., and the J. D. Hunt Mfg. Co. Inc., Indianapolis. The Federal Signal Co., Albany, N. Y., asked for prices on 14 or 15 machines and the Western Electric Co., Chicago, was reported as purchasing between 20 and 30 lathes.

Presses of various types seemed to be in good demand during the month. Stamping presses were sought by the Acklin Stamping Co., Toledo, O.; Commercial Shearing & Stamping Co., Youngstown, O.; Davis Metal Fixture Co., Lansing, Mich., and the Ohio Municipal Equipment Co., Columbus, O. The C. C. Fouts Co., Middletown, O., asked for prices on several other presses and the Mansfield Electric Hardware Co., Mansfield, O., exchanged several Sidney presses in Cleveland for Niagara presses.

Dullness Pervades Automotive and Allied Industries

IN AUTOMOTIVE lines, the dullness has been most pronounced. This was perhaps natural and to be expected in view of the curtailed production programs instituted at practically all pleasure car plants. With the inauguration of the price-cutting movement, however, it is thought possible that increased production will be resumed and in that event, the automotive industry again will assume an important place as a machinery buying factor. Some slight indication of this was noted in Chicago with the replacement of some business which previously had been canceled. A list is expected soon from the Fageol Motors Co., East Seventy-ninth street, Cleveland, which is to manufacture trucks. The W. S. M. Tractor Corp., Akron, O., is looked to for a large list of production equipment for its tractor plant. The Porter Tractor Co., Colfax, Ia., announced it would purchase all sorts of tractor-making machinery.

Crane Market Is Comparatively Listless

KEEN competition marked a listless crane market throughout the past month. A market for many locomotive cranes was found in Chicago among manufacturers who are utilizing them for coal storage. Some eastern railroads are said to be negotiating for considerable special coal-handling equipment, and the Japanese government is making overtures for a large quantity of conveying machinery. The largest crane project current in the East is that of 34 cranes for piers Nos. 12 and 13 on Staten Island. Crane requirements of the New York Central are said to equal $100,000. The A. Garrison Foundry Co., Pittsburgh, entered the market for four cranes and the Metal & Thermit Corp., New York, purchased three as did the Chapman Valve Co., Indian Orchard, Mass., and the West India Sugar Finance Corp., New York. The American Car & Foundry Co. awarded four for its Terre Haute and one for its Buffalo plant.

Tool Users Look for Reductions

Remain Out of Market in Hope That Manufacturers Will Follow Suit in Price Cutting Movement — Japanese Seeking Both Machine Tools and Cranes in New York—Railroads Are Not Closing

EXPECTATION on the part of buyers that equipment manufacturers will fall in line with manufacturers of other products who are reducing prices, makes for a continuance of the dull market which has prevailed for several weeks. Manufacturers give no encouragement, however, in this regard. Some state that in their opinion, price reductions will not stimulate the present inactive market. In the East, considerable inquiry has been received from Japan both for machine tools and for cranes. Tokio is asking for 33 machines but orders so far have been withheld and the export market generally is quiet as to actual sales. Preliminary estimates on 1921 machine tool requirements are sought in Pittsburgh by both railroads and steel companies. Apart from indicating sizable business for next year, these are unimportant at this time however, in view of the fact that appropriations have not been settled upon as yet, and the further fact that both railroads and steel companies are either canceling or suspending present orders. Some companies canceling new machinery are buying second hand. The Pennsylvania lines west recalled one sizable inquiry. The largest order reported in Pittsburgh the past week, called for five machines.

Railroads are absent from the western markets because proper financial arrangements have not been consummated. Several railroad lists issued in Chicago recently have not been placed and expected lists have not developed in Cleveland. In the latter city, dealers are concerned over poor collections and are experiencing considerable difficulty in getting their customers to pay their bills. Several press inquiries are reported and one sale of four presses to the American Welding Mfg. Co., Warren, O., is noted. The National Lamp Works, Cleveland, is expected to buy heavily this week. Several inquiries for one, two and a few tools are being worked.

The majority of crane inquiries and sales call for one each. The Johnston & Jennings Co., Cleveland, wants electric cranes. The Griffin Wheel Co. purchased nine cranes. The Japanese navy is seeking overhead cranes in this country, three with auxiliaries for a foundry and seven for the navy yard, together with one large special shipbuilding crane. Frazer & Co., New York, want a 200-ton crane and one 30-ton for shipment to Japan and the Imperial Japanese Steel Works is said to have placed an informal order for an 80-ton crane. Peacock Bros., Montreal, bought two cranes. John Beuker as representative for Van Gelde Sons, Amsterdam, Holland, is in New York obtaining quotations on dock cranes. Another dock project to arouse interest is for the Savannah & Atlanta railroad which will cost $2,000,000.

Foreign Inquiries Feature Eastern Tool Market

NEW YORK, Oct. 2.—A slight improvement in miscellaneous buying features the eastern machine tool market, although there are no good-sized orders and but few sizable inquiries. The larger inquiries now coming before the trade are almost without exception from foreign interests and include one list of 33 metal-working and woodworking machines for the municipality of Tokio, Japan. As far as actual buying is concerned, however, the export market is exceedingly dull.

While dealers and manufacturers' representatives report that as yet there has been no evidence of shading in prices, it is believed in many quarters that prospective buyers confidently are expecting this development, and for that particular reason are holding off.

Machine tool salesmen assert that they are confronted with the price problem on most every hand. Prospective purchasers point to declines in various commodities, to the marked improvement in machine tool deliveries, and to the lowering of current production costs. They claim that while the cost of raw materials and the level of wages has remained virtually unchanged so far, the increased efficiency of labor is undoubtedly contributing materially to a lowering in the cost of output.

Equipment manufacturers, on the other hand, state that the reduction in current operating costs is slight and is more than offset by cancellations and loss in recent months due to labor troubles and inability to obtain raw materials, this latter combination not only resulting in many of the aforementioned cancellations, but in increased overhead on the work produced and their inability to accept considerable business owing to poor deliveries.

Furthermore, they express the opinion that the present lull is but temporary, and that equipment requirements are accumulating in heavy volume. They point to large lists that have been before the trade for some time, and to various projects requiring machine tools, now held up, but likely to go through later.

It is the opinion of one large machine tool builder that the lowering of prices at this time, with so many outside forces at work to depress trading, such as the continued money stringency, coming election, and near approach of the winter season, would do little to stimulate activity.

Included in electric overhead crane orders of the past week is a 5-ton crane with 45-foot span for the Federal Shipbuilding Co., Kearny, N. J., this business going to the Milwaukee Electric Crane & Mfg. Co., Milwaukee. An order for a 15-ton electric crane with 48-foot span has also been placed by Lockwood, Greene & Co., Boston. This crane is for installation at the Somersworth, N. H., plant of the Great Falls Mfg. Co. The order of the

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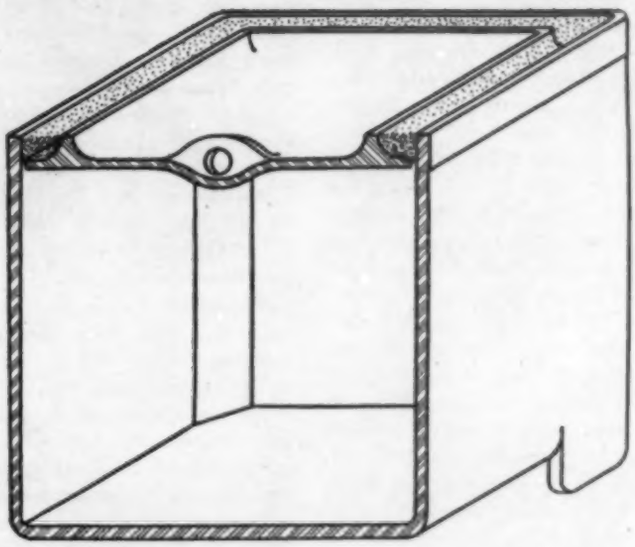

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LUDLUM STEEL COMPANY

General Office and Works

WATERVLIET, N. Y.

Say you saw it in THE IRON TRADE REVIEW

Metal & Thermit Co., 120 Broadway, New York City, involving two 10-ton electric cranes with 38-foot span and one 3-ton grab bucket crane with 26-foot span, reported last week, went to the Shaw Electric Crane Co., Muskegon, Mich.

Announcement is expected at any time relative to the award of an 80-ton electric crane, with 80-foot span, for the Imperial Japanese Steel Works. Bids recently were opened, and it is understood that the business has been informally placed. No action has as yet been taken by the Japanese navy department on its list of 10 electric overhead cranes, ranging in capacity from 5 to 60 tons. Of this number, a 20, 30 and 40-ton crane, each with 5-ton auxiliary, are for installation in a foundry. The remainder are for shipyard use. This list has been issued through several local interests, one of whom is the Amplex Co., 6 West Thirty-second street. In addition, Frazer & Co., 30 Church street, New York, are inquiring for one 200-ton crane, with 53-foot span, and one 30-ton crane with 52-foot span for shipment to Japan. There is also one large special shipbuilding crane now being inquired for by the Japanese navy department.

Among recent orders received by the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., are two 3-ton overhead electric cranes, with 20-foot span, one 1-ton crane with 10-foot span, two 2-ton cranes with 20-foot span, two 3-ton cranes with 30-foot span, and two 2-ton cranes with 34-foot span for the Griffin Wheel Co., Council Bluffs, Iowa; one 5-ton crane with 34-foot span for the Philadelphia Paper Mfg. Co., Pencoyd, Pa.; one 1-ton crane with 20-foot span, for the Merchants Iron & Coal Storage Co., Los Angeles, and two 5-ton cranes with 40-foot span, for Peacock Bros., Montreal, Canada.

The Phoenix Utility Co., 71 Broadway, reported last week as closing on a 65-ton overhead crane, placed this business with the Northern Engineering Co., Detroit.

Of interest to a number of crane manufacturers at this time is a $2,000,000 dock and coal handling project now contemplated by the Savannah & Atlanta railroad, Savannah, Ga. The project, it is understood, is being partially financed by Imbrie Co., 65 Broadway, New York. Charles E. Gay, Savannah, Ga., is engineer in charge.

The Keystone Engineering & Equipment Co., 115 Broadway, recently in the market for electric traveling crane equipment, has temporarily withdrawn its inquiry. Van Gelde Sons, paper manufacturers, of Amsterdam, Holland, are inquiring for dock cranes. John Beuker is now in New York City, securing estimating figures. The Borough of Bronx has just opened bids on an electric derrick.

Potential 1921 Business Appears in Pittsburgh

PITTSBURGH, Oct. 5.—Requests being made of machine tool builders by railroads and steel companies for preliminary estimates for 1921 requirements are one of the outstanding features of the machine tool market of the past week. While some of these inquiries may not develop into actual purchases and the railroads have not yet prepared their appropriations for equipment, significance is attached to the interest being manifested by these large buyers and gives rise to the hope that the market will become more active in the near future. As a counter to this more hopeful tone is the fact that both railroad and steel companies have cancelled and suspended some fair sized business and also have held up inquiries.

Generally, the machine tool trade is devoting its attention to the matter of making shipments against contracts and in view of the improvement in the railroad situation, they are making considerable progress in this direction. The Pennsylvania lines west which recently put out an inquiry for two 24-inch lathes, high speed hack saw machines, a 24-inch shaper, a 6-foot radial drill, two upright drills and two combination motor-driven wet and dry floor grinders for the central region has withdrawn from the market temporarily. Actual contracts taken during the past week have been light. One of them, closed with a Pittsburgh dealer, involves two 30-inch, 16-foot lathes, one 18 x 8-inch lathe, and two 20-inch upright drills. Inquiry for rolling mill equipment has fallen off but one large order recently has been closed. It has been observed that some of the buyers who cancelled orders for new equipment have purchased second hand tools.

Cleveland Dealers Have Trouble Making Collections

CLEVELAND, Oct. 5.—Difficulties encountered in making collections of invoices for machines shipped, is what is engaging the major portion of the attention of the machine tool dealers in this vicinity at the present time. Companies who ordinarily discount their bills are asking for three to four months extension and this has a tendency to make sellers careful about taking on new business. Due to this condition and the further fact that users are disinclined to place orders at a time when they believe prices will come down notwithstanding advice from manufacturers that they cannot now be reduced, orders are more or less scarce. Orders for single tools or small groups of machines continue to be placed from time to time and some sizable orders are expected this week chiefly from the National Lamp Works, Cleveland These mostly are for shipment to Buffalo and will apply on the lists issued recently which are said to comprise 125 machines including milling machines, automatic screw machines, lathes, etc.

Apparently a good market exists on presses; sellers reporting that they are working on a number of press inquiries. One calling for one 1000-ton press is expected to be closed shortly. Four presses were bought last week in Cleveland by the American Welding & Mfg. Co., Warren, O., which company now is taking quotations on one each 3-spindle drill, plain surface grinder, No. 2 and No. 3 Consolidated presses, fly wheel type. It is enlarging its plant. Stamping presses are to be bought soon by the Schiffmacher-Fillinger Co., Buffalo, organized recently to make tools and stamped goods.

Smaller inquiries are fairly frequent, although complaints still are voiced that so often they do not develop into orders. The Doehler Die Castings Co., Toledo, O., is said to be in the market for a number of Rockford lathes. Among the machinery required by the F. O. Stallman & Supply Co., San Francisco, for one of its customers is one vertical boring mill, one turret lathe, one multiple spindle drill. The Cyclone Brush Co. wants automatic screw machines. The Freeman Motor Co., Whitney Power block, Cleveland, is in the market for one universal grinding machine, while the Geneva Metal Wheel Co., Geneva, O., wants one Stewart forge without blowers. The National Tube Co., Lorain, O., is in the market for one combined bench and slitting shear for 18-gage or lighter material. The Marion Die Tool Co., Marion, O., wants a keyseating machine, while William J. Koehler, 1336 Giddings road, Cleveland, is in the market for Sidney lathes and the Caskey-Dupree Mfg. Co., Marietta, O., wants Hendey lathes. The Upson-Walton Co., The Oster Mfg. Co., and the Cleveland Fare Box Co., are some Cleveland companies who are negotiating with Cleveland dealers for machine tool and equipment requirements. The Cleveland Tractor Co., Cleveland, recently bought a drill and is understood to want a dozen machinists' vises. The Superior Screw & Bolt Co., Hippodrome building, Cleveland, is about to close on some nut castellating machines as well as equipment for the tool room of its new plant. The Thomart Motor Co., Kent, O., is

Rolling Mill Jim Wants To Know Who's Goin' To Take The Cut

Say, Fellas:

Funny thing about all this talk on the High Cost O'Living. Everybody's going to cut it, but nobody wants to take the cut. But if you really want to cut the cost of production, USE HUBBARD ROLLS. They do it!

So Long,

Rolling Mill Jim.—

Hubbard Steel Foundry Co.

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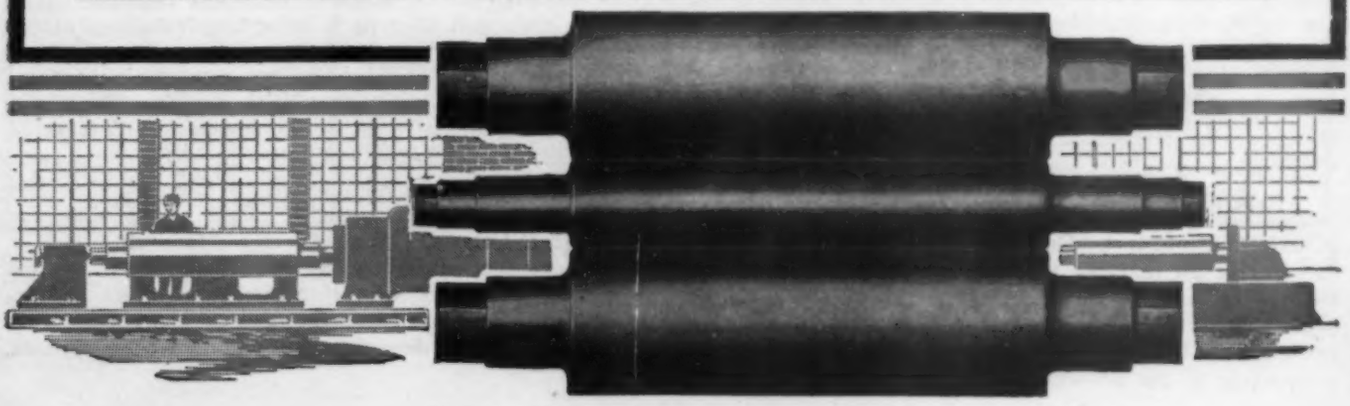
All Kinds of Iron and Steel Rolls and Steel Castings



Say you saw it in THE IRON TRADE REVIEW

assembling Akron speedwagons at its plant but needs a high speed saw among other equipment. After the first of the year this company is expected to buy manufacturing equipment. The March Auto Parts Co., Norwalk, O., is understood to be in need of some machinery for a new plant.

Special machinery is being designed by the Continental Motors Corp., Detroit, for the production of four new truck engine model motors. Blue prints are expected to be issued to manufacturers soon. Equipment for a 50 x 250-foot factory to increase its fire extinguisher manufacturing facilities, is to be purchased by the F. R. X. Mfg. Co., Norwalk, O. It recently increased its capital from $150,000 to $350,000. Other concerns who have increased their capital stock lately include: The Continental Car Co. of America, Louisville, Ky., from $500,000 to $1,150,000; the Hale Electric Mfg. Co., Cleveland, from $1250 to $115,000; the Imperial Rubber Co., Orrville, O., from $25,000 to $100,000; Tower Motor Truck Co., Greenville, Mich., from $500,000 to $2,500,000 for erecting and equipping a 2-story addition, 60 x 100 feet; the Akron Electric Supply Co., Akron, O., from $50,000 to $100,000; and the Williamson Heater Co., Cincinnati,, O., from $400,000 to $1,000,000.

The plant of the Selik Tool & Machine Co., Detroit recently was damaged by fire while the Tredegar Co., Richmond, Va., suffered a $200,000 loss from the same cause in its pattern and machine shops. Some equipment will have to be replaced.

Other companies who are prospective machine tool purchasers are: The American Geometric Appliance Co., Cleveland, incorporated at $15,000 by G. W. Fleming and S. Ward; the U. S. Steel Spring Wire Co., Cleveland, capital $20,000 by E. Brown and L. S. Sobel; the Delaware Brass Co., Delaware, O., incorporated at $125,000; the New Advance Machinery Co., Van Wert, O., reincorporated at $100,000; American Steel Tie Co., Toledo, O., incorporated at $100,000; Clymer Machine Co., Cleveland, capital $20,000, organized by J. A. Fenner and C. L. Stocker; Detroit Carburetor Co., Detroit, $100,000 capital, organized by T. W. Halloran, 120 Milford avenue, Detroit; Interstate Appliance Co., Jackson, Mich., incorporated at $500,000 by C. J. Holmes and others; United Engineering & Foundry Co., Canton, O., to enlarge plant; the Miller Airplane Co., Dayton, O., to erect 2-story plant; Gustave Wiedeke & Co., Dayton, O., has awarded a contract for a 2-story addition; R. F. Carpenter Mfg. Co., 978 East Sixty-fourth street, Cleveland, will erect a 1-story addition; Lucius Reinforced Tank Co., Massillon, O., to erect 1-story plant, 70 x 160 feet, to cost $15,000; the Clay Engine Mfg. Co., 864 East Seventy-second street, Cleveland, to erect a $50,000 building; the Windau Tool Co., 1565 East Seventeenth street, Cleveland, a 46 x 130-foot addition; the Warnsman Truck Body Co., 5818 Walworth avenue, Cleveland, to erect a 1-story building to cost $10,000; and the Industrial Appliance Co., Massillon, O., recently organized with $30,000 capital by J. C. Lewis and E. F. Reinoehl.

Sellers of cranes report a quiet market. Several inquiries of one crane each have been received and a few orders of that size have been booked. The Johnston & Jennings Co., Addison road, is in the market for electric cranes.

Expectation of Lower Prices Makes Dull Market

CHICAGO, Oct. 4.—Dullness continues in the Chicago market for machine tool equipment, which is featureless. The general decline in prices which seems to be uppermost in all minds at present is having a depressing effect, both because machinery users are awaiting developments in the possibility of lower cost of equipment, and because demands on their present plants are being more or less reduced by a similar attitude on the part of their customers. No reduction in prices has appeared yet and dealers do not know what attitude manufacturers will take in this respect. In any event, it is stated that machines in stock in dealers' warehouses will be reduced if such a move is made, the makers bearing the shrinkage.

Railroads continue to absent themselves from the market and large lists which have been figured in past weeks have not been placed, their financing apparently being delayed. Little new inquiry is being received from roads, the Santa Fe being in the market for a 4-foot radial drill. In various spots machine tool users find themselves hard hit by the present contraction in business and instead of needing more equipment find what they have temporarily out of use. Considerable demand exists for boilers and power equipment, many concerns having operated for some time with inadequate power facilities, and now are equipping to meet this need.

Railroads Expected to Substitute for Automotive Lines

TORONTO, Ont., Oct. 2.—During the past week Canadian dealers in machinery and machine tools found business active and that the demand is improving. While no large lists appeared during the week a number of small buyers sought single machines and the number of these disposed of was termed "satisfactory" by sellers. Dealers are not looking for much buying from the automobile trade for some time as several of these have recently cut down production and their equipment requirements have fallen off accordingly. During the past three or four weeks the Canadian National railways has been in and out of the market repeatedly for small lots and dealers are now expecting much heavier buying from this quarter. The Canadian Pacific railway and the Grand Trunk are also looked to as possible customers to take the place of the automobile industry as these two systems are urgently in need of equipment for their shops.

Prospective buyers of machinery and tools include the Ruggles Motor Truck Co., which has secured a site on Dundas street, London, Ont., where it will start work at once on the erection of a manufacturing plant, 86 x 417 feet to cost $250,000. The London Concrete Machinery Co., that city, will build an addition to its plant 60 x 240 feet, and in the near future proposes to make further additions and to install considerable equipment greatly to increase its manufacturing capacity. Beatty Bros., also of London, will build an addition to their plant so as to increase its output of barn equipment. The Ford Motor Co., of Canada, Portage avenue, Winnipeg, Man., will build a $10,000 workshop. The Bates Valve Bag Co., 7410 North street, Chicago, will build a factory on Battery street, Niagara Falls, Ont. The Canadian National railways, will extend the engine house to accommodate 14 more engines, install a coal plant and make other improvements costing $200,000 at Chaudiere Junction, Que. The Exide Battery Co., of Canada, Ltd., 153 Dufferin street, Toronto, Ont., will alter its building and install machinery for the manufacture of batteries, electrical equipment, etc., to cost $50,000. The John Deere Mfg. Co., Welland Junction, Ont., will build an addition to its paint shop, construct a dry kiln and make other improvements to plant, costing $50,000. The John Inglis Co., Strachan avenue, Toronto, will build an addition to its foundry. Secretary R. C. Desrochers, department of public works, dominion government, Ottawa, Ont., will receive bids until Dec. 9, for construction of drydock at Esquimalt, B. C., to cost $5,000,000. Plans are with the district engineers at Victoria, B. C., Toronto, Montreal, Que., Post Office, Vancouver, B. C., and department of public works, Ottawa, Ont.

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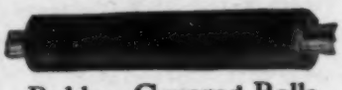
Rainbow Packing

Perfected Water Hose



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BELTING	HOSE	PACKINGS	MISCELIANEOUS
Transmission *"Rainbow," "Pilot" "Shawmut"–"Giant Stitched"* **Conveyor** *"United States," "Grainster"* **Elevator** *"Matchless," "Granite," "Grainster"* **Tractor** *"Sawyer Canvas" "Little Giant Canvas"* **Agricultural** *"Rainbow," "Bengal" "Grainster," "Sawyer Canvas"*	**Air** *"4810," "Dexter"* **Steam** *"Rainbow," "Giant," "Perfected"* **Water** *"Rainbow," "Mogul," "Perfected"* **Suction** *"Amazon," "Giant"* **Garden** *"Rainbow," "Mogul," "Lakeside"* Also Hose for Acetylene, Oxygen, Acid, Air Drill, Auto Radiator, Car Heating, Air Brake, Gasoline, Oil, Hydraulic, Chemical, Coke, Creamery, Discharge, Vacuum, Sand Blast, Spray, etc.	**Sheet** *"Rainbow," "Vanda," "Paramo"* **Rod** *"Wizard," "Rainbesta," "Peerless," "Honest John," "No. 573" and hundreds of other styles in coils, rings, gaskets and diaphragms —* **Usco Valves —** THE RIGHT PACKING IN THE RIGHT PLACE	Mats, Matting and Flooring, Plumbers' Specialties, Rubber Covered Rolls, Friction Tape, Splicing Compd., Dredging Sleeves, Hard Rubber Goods, Printers' Blankets, Tubing, Soles, Heels, Jar Rubbers, Moulded Goods

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Concise and Timely Business Building Opportunities
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Among New England Plants

BEVERLY, MASS.—The Frost Machine Co. recently was incorporated with a capital stock of $10,000, by H. N. Loomer, Charles O. Frost and C. H. Lutes.

BOSTON.—The Brown Auto Specialties Co. has been organized with a capital stock of $150,000 by H. L. Brown, Patrick J. Henry and others.

BOSTON.—The Quincy Ornamental Iron Works has been organized by Simon George, Thomas W. Doud and Daniel F. Stevens.

BOSTON.—The Federal Arch-Lift Mfg. Co. has been incorporated with a capital stock of $25,000 by Walter M. Ludwig, William H. Jones, Hanover, Mass., and S. E. Jones.

BOSTON.—The International Steel Toy Co. has been incorporated to do metal stamping and assembling with $100,000 capital, by Arthur C. Pearce, Brookline, Mass., Laurence A. Charlton and A. Oare.

BOSTON.—The Metallurgical Development Corp. has been incorporated with 3000 common shares of no par value by Robert Johnson, Charles L. Favinger, Waban, Mass., and Frederick W. Eaton.

CLIFTONDALE, MASS.—The Winera Machine & Mfg. Co. has been incorporated to make automobile parts with $50,000 capital by Ralph S. Power, Nelson E. Power and Gardner B. Fassett, Beverly, Mass.

LYNN, MASS.—The Lynway Aircraft Corp. has been incorporated to build flying machines with $100,000 capital by Thomas F. Hennessey, Linwood W. Tracy, Boston, Dominio G. Costa and others.

NEW HAVEN, CONN.—The American Mfg. & Trading Co. has been incorporated with $100,000 capital by Alfred Lamberg, New York, Hyman Botwinik, M. M. Levine and B. E. Hoffman.

SAGAMORE, MASS.—The Keith Car Co. has purchased a large tract of land and will erect additional buildings.

SALEM, MASS.—D. J. Long Co., 337 Essex street, machinist, is reported planning a 1-story plant addition to cost $10,000.

SPRINGFIELD, MASS.—A. A. Geisel, 111 Magnolia terrace, is reported planning a 1-story, 60 x 120-foot plant building, to be devoted to the manufacture of motor truck parts, and to cost about $40,000.

WATERBURY, CONN.—The Arrow Fasteners, Inc., has been incorporated with $75,000 capital by M. W. Horowitz, Samuel Traurig and Jacob Horowitz, Ansonia, Conn.

WORCESTER, MASS.—The Worcester Foundry Co., Inc., has let the contract for a 1-story, 60 x 148-foot addition to cost $25,000.

WORCESTER, MASS.—The Star Brass Foundry has been organized by William A. Latour, and Philip A. Latour, Roslindale, Mass.

WORCESTER, MASS.—T. Smith & Co., 285 Grove street, is reported planning the erection of a plant for the manufacture of bolts, etc.

EAST WARREN, R. I.—The Greyhound Valve Corp. is reported planning a 1-story, 100 x 200-foot plant at a cost of $100,000.

NEWPORT, R. I.—The Specialty Hardware Mfg. Co. has been incorporated with $50,000 capital by James A. Blaisdell, William Lynas and James H. Miller Jr.

WOONSOCKET, R. I.—The American Wringer Co. has let the contract for a 3-story, 66 x 180-foot mechanical roll building.

BRIDGEPORT, CONN.—The Belknap Mfg. Co., 145 Water street, manufacturer of brass goods, is reported planning a plant, 1-story, 35 x 65 feet, to cost $12,000.

BRIDGEPORT, CONN.—The Cornwall & Patterson Co., State and Fairchild avenues, has awarded a contract for a 1-story, 85 x 100-foot plant addition, to be devoted to the manufacture of piano hardware.

NEW BRITAIN, CONN.—The Vulcan Iron Works has let the contract for a 1-story, 90 x 100-foot addition.

NEW BRITAIN, CONN.—The B. Jahn Mfg. Co. 6 Chestnut street, is reported planning a plant, 3-stories, 40 x 150 feet, for the manufacture of dies, tools, etc., to cost $50,000.

North Atlantic States

BATAVIA, N. Y.—The Batavia Car Works, locomotives, has been incorporated with a capital stock of $350,000, by J. Baukat, A. J. Waterman and R. M. Walker.

BINGHAMTON, N. Y.—The Hotchkiss Steel Products Co. recently was incorporated with a capital stock of $200,000, by M. S. and M. R. Hotchkiss and William Roe.

BROOKLYN, N. Y.—The plant of the Robert Finlay Mfg. Co., gas fixtures, etc., recently was damaged by fire.

BROOKLYN, N. Y.—The Doehler Die Casting Co. plans extensions and improvements to its plant at a cost of $20,000.

BROOKLYN, N. Y.—The Central Ignition Products Co. has been incorporated with a capital stock of $30,000, by J. D. Klein, H. I. Gross and A. A. Kaminester, 8 Buffalo avenue.

BUFFALO.—The Buffalo Machine Key Co., 134 Clyde street, is reported planning a plant, 14 x 36 x 66 feet, to cost $5000.

BUFFALO.—The Zero Valve & Brass Corp. recently was incorporated with a capital stock of $25,000, by E. K. and P. H. and C. H. Hyde.

BUFFALO.—Oppenheimer & Co., 140 Elmer street, is reported planning to convert a 5-story, 60 x 230-foot building, into a metal goods factory, at a cost of $15,000.

EAST ROCKAWAY, L. I., N. Y.—The Eastern Engineering & Construction Supply Co. plans a 1-story plant, 121 x 300 feet at a cost of $80,000.

JAMESTOWN, N. Y.—The city council has plans for an electrically operated pumping plant, 70 x 112 feet, to cost about $60,000.

JAMESTOWN, N. Y.—The Crescent Tool Co., Foote avenue and Harrison street, is reported planning a forge shop, one story, 44 x 144 feet.

NEW YORK.—Isidor Blickman, 479 First avenue, manufacturer of sheet metal products, has leased a 3-story building for a new plant.

NEW YORK.—The Standard Wire Tire Corp. has been incorporated with a capital stock of $100,000, by A. L. Chauvet, B. J. Bowers, and S. S. Shears, 221 Hancock street.

NEW YORK.—The A. C. Chesley Co., 77 Rider avenue, metal covered doors, etc., has acquired a site for a plant, 50 x 120 feet.

NEW YORK.—The Electric Steel Pipe Corp. recently was incorporated with a capital stock of $110,000, by Thomas R. Hast Jr., Ralph O. Willigis and Arnold R. Boyd, 165 Broadway.

NEW YORK.—Alexander Mayer & Co., iron and steel, recently was incorporated with a capital stock of $50,000, by T. E. and F. Behr Jr., and J. C. Ross, 165 Broadway.

NEW YORK—The Colorado River Power Co. has been incorporated with a capital stock of $10,000, by C. H. Stanton, J. B. Knox and A. M. Hartman, 36 St. Nicholas avenue.

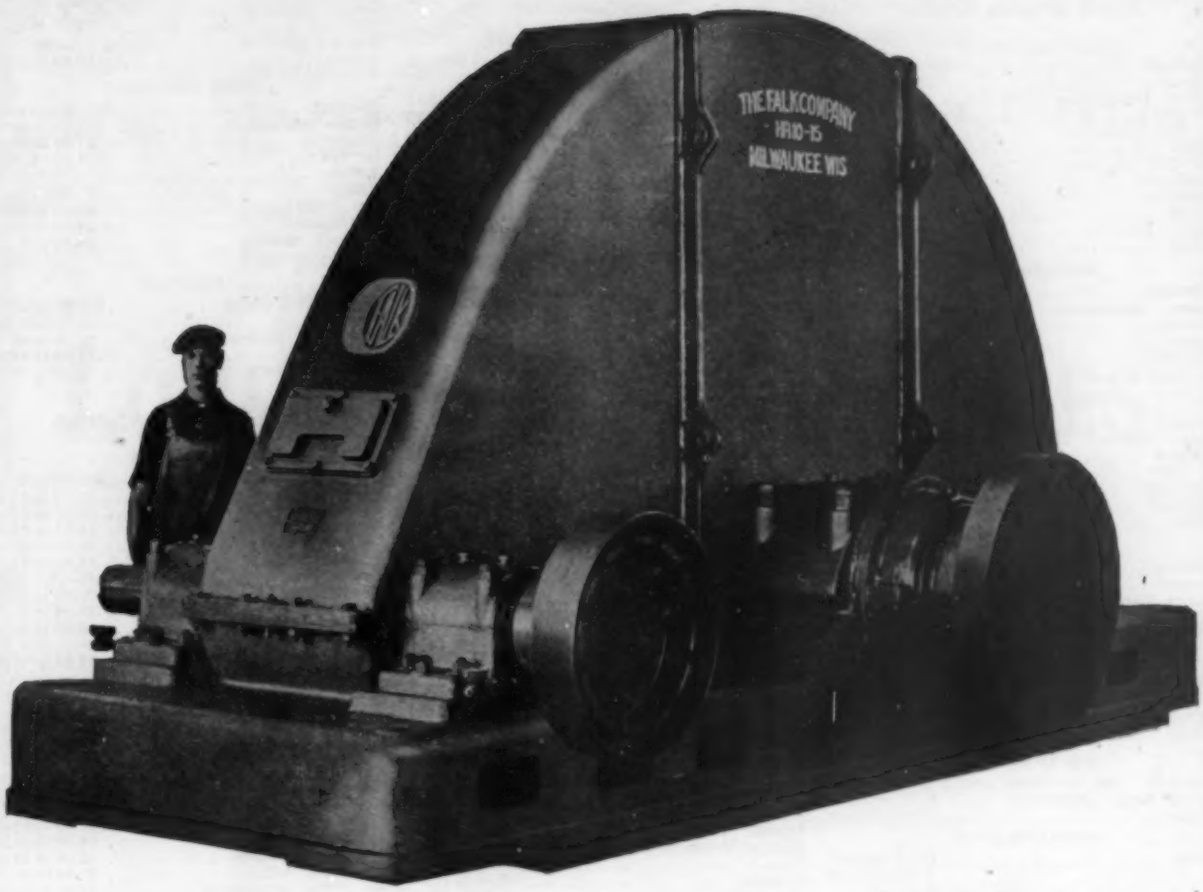
NEW YORK.—The Farmoda Heater Corp. has been

(*Continued on page* 1030)

Tools Sell Quickly

THE recent closing out sale by the Boston district ordnance salvage board at the proving ground in Scituate, Mass., which lasted three days, netted $419,066.57. *The sale attracted* 800 *from all over the United States and Canada. It comprised* 1900 *listed lots, which were sold on an average of* 2.02 *lots per minute for the three days. In the offering were hundreds of machine tools, machines and equipment, in addition to raw materials and scrap.*

Herringbone Gears Units



Large steel mills have accorded FALK Herringbone Gears universal recognition for their electric drives, and heavy shaft line drives.

They have found that these gears are absolutely dependable and eliminate all shock, noise and vibration. They reduce upkeep and consumption of power.

Steel Castings

From 1 Pound to 100,000 Pounds

WRITE FOR FALK LITERATURE

The Falk Company, Milwaukee, Wis.

REPRESENTATIVES:

PITTSBURGH—W. O. Beyer, 1007 Park Building
NEW YORK—M. P. Fillingham, 50 Church Street
SAN FRANCISCO—F. W. Grimwood, Rialto Building
DENVER, COLO.—Denver Engineering Works
WILKES-BARRE, PENNA.—Vulcan Iron Works

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Pittsburgh	$28.00 to $28.50
Chicago	22.00 to 23.00
Eastern Pennsylvania	24.00 to 25.00
Cleveland	25.00 to 25.50
St. Louis	21.00 to 21.50
Buffalo	26.00 to 27.00
New York (dealers)	19.00 to 20.00
Birmingham	20.00 to 24.00
Cincinnati	23.00 to 23.50
Valleys	26.25 to 26.50
Boston (dealers)	18.00 to 20.00
Detroit	21.00 to 22.00

BUNDLED SHEETS

Pittsburgh	$17.50 to 18.00
Eastern Pennsylvania	17.00 to 18.00
Cleveland	14.50 to 15.00
Buffalo	16.50 to 17.50
Cincinnati	15.00 to 16.00
St. Louis	11.00 to 11.50

STEEL RAILS, SHORT

Chicago	$26.00 to 27.00
Boston (dealers)	21.50 to 22.50
Cleveland	23.00 to 24.00
St. Louis	23.00 to 23.50
Birmingham	20.00 to 22.00
Cincinnati	28.00 to 29.00
Detroit	23.00

STOVE PLATE

Pittsburgh	$31.00 to 32.00
Chicago	30.50 to 31.50
Eastern Pennsylvania	26.50 to 27.50
Cleveland	28.50 to 29.00
Detroit	26.00 to 27.00
Birmingham	25.00 to 26.00
Buffalo	31.50 to 32.00
New York	24.50 to 25.00
St. Louis	26.00 to 26.50
Cincinnati	27.00 to 28.00
Boston (consumers)	26.00 to 27.00

LOW PHOSPHORUS

Pittsburgh, billet and bloom crops	$34.00 to 35.00
Eastern Penn. (guaranteed)	33.00 to 34.00
Buffalo	33.00 to 34.00

SHOVELING STEEL

Chicago	$21.0 to 22.50
St. Louis	20.50 to 21.00

KNUCKLES, COUPLERS AND SPRINGS

Pittsburgh	$31.50 to 32.00
Chicago	26.00 to 27.00
St. Louis	23.00 to 23.50
Eastern Pennsylvania	30.00 to 31.00

BALED SHEETS

Pittsburgh	$24.00 to 25.00
Chicago	18.50 to 19.00
Detroit	14.00 to 15.00
Buffalo	23.50 to 24.00

FROGS, SWITCHES, GUARDS

Chicago	$22.00 to 23.00
St. Louis	21.00 to 21.50
Eastern Pennsylvania	24.00 to 25.00

BOILER PLATE, CUT

Detroit	$15.00 to 16.00
St. Louis	17.00 to 17.50

ANGLE BARS—STEEL

Chicago	$26.00 to 27.00
St. Louis	24.00 to 24.50

Iron Mill Scrap

RAILROAD WROUGHT

Pittsburgh, No. 1	$32.00 to 32.50
Pittsburgh, No. 2	28.50 to 29.00
Chicago, No. 1	24.50 to 25.50
Chicago, No. 2	24.50 to 25.50
Eastern Pennsylvania No. 1	32.00 to 33.00
Cleveland, No. 1	30.00 to 31.00
St. Louis, No. 1	24.00 to 24.50
St. Louis, No. 2	22.00 to 22.50
Buffalo	31.50 to 32.50
Cincinnati	29.00 to 30.00
Birmingham, No. 1	23.00 to 24.00
New York No. 1 (dealers)	29.00 to 30.00
Boston (dealers)	24.00 to 25.00

WROUGHT PIPE

Eastern Pennsylvania	$21.50 to 22.50
Buffalo	20.50 to 21.50
New York (dealers)	18.50 to 19.00
Boston (dealers)	17.00 to 18.00

YARD WROUGHT

Eastern Pennsylvania, No. 1	$27.50 to 28.50

CITY WROUGHT

New York, long (dealers)	$24.50 to 25.00

BUSHELING

Chicago, No. 1	$21.25 to 22.25
Chicago, No. 2	12.25 to 13.25
Cleveland, No. 1	20.50 to 21.00
Cleveland, No. 2	17.75 to 18.25
St. Louis, No. 1	20.00 to 20.50
Buffalo No. 1	19.50 to 20.50
Cincinnati, No. 1	21.00 to 21.50
Eastern Pennsylvania, No. 1	17.00 to 18.00
Detroit No. 2	12.00 to 12.50

MACHINE SHOP TURNINGS

Pittsburgh	$16.00 to 16.50
Chicago	10.00 to 10.50
Eastern Pennsylvania	18.00 to 19.00
Cleveland	12.00 to 12.25
Buffalo	15.00 to 16.00
New York (dealers)	14.50 to 15.00
St. Louis	11.00 to 11.50
Detroit	9.50 to 10.50
Cincinnati	12.50 to 13.00
Birmingham	10.00 to 12.00
Valleys	13.00 to 13.25
Boston (dealers)	14.00 to 14.50

CAST IRON BORINGS

Pittsburgh	$20.00 to 21.00
Chicago	14.00 to 14.50
Eastern Pennsylvania	22.50 to 23.50
Eastern Pennsylvania (chemical)	23.00 to 24.00
Cleveland	16.00 to 16.50
St. Louis	13.00 to 13.50
Detroit	14.00 to 15.00
Buffalo	21.00 to 22.00
New York (dealers' price)	17.00 to 17.0
Cincinnati	15.00 to 16.00
Birmingham	11.00 to 13.00
Valleys	18.25 to 18.75
Boston (dealers)	15.00 to 16.00

MIXED BORINGS AND TURNINGS

(For blast furnace use)

Eastern Pennsylvania	$17.00 to 18.00
Boston (dealers)	13.00 to 14.00
Cleveland	16.00 to 16.50

IRON AXLES

Pittsburgh	$52.00 to 53.00
New York (dealers)	46.00 to 47.00
Chicago	48.50 to 49.00
Eastern Pennsylvania	45.00 to 46.00
Detroit	37.00
Cleveland	46.00 to 47.00
St. Louis	42.50 to 43.00
Buffalo	39.00
Cincinnati	36.00 to 37.00
Birmingham	28.00 to 30.00

IRON RAILS

Chicago	$36.00 to 36.50
Cleveland	31.00 to 32.00
St. Louis	32.00 to 32.50
Buffalo	31.00 to 32.00
Cincinnati	26.00 to 27.00

PIPES AND FLUES

Chicago	$17.0 to 18.00
Cleveland	23.00 to 24.00
Detroit	16.00
St. Louis	18.00 to 18.50
Cincinnati	19.00 to 20.00

GRATE BARS

Chicago	$29.00 to 29.50
Cleveland	31.00 to 32.00
Detroit	24.00 to 25.00
Buffalo	25.00 to 26.00
New York	24.00 to 25.00
Eastern Pennsylvania	29.00 to 30.00

FORGE FLASHINGS

Cleveland, large	$20.00 to 21.00
Chicago, small	20.00 to 21.00
Cleveland, small	18.00 to 18.50
Boston (dealers)	12.00 to 13.00
Detroit	19.00 to 20.00

FORGE SCRAP

Chicago	$24.50 to 25.50
Eastern Pennsylvania, No. 1	17.00 to 18.00
Boston	12.00 to 13.00

ARCH BARS AND TRANSOMS

Chicago	$39.50 to 40.00
St. Louis	33.50 to 34.00

ANGLE BARS—IRON

Chicago	$37.50 to 38.00
St. Louis	32.00 to 32.50

Iron and Steel Works Scrap

AXLE TURNINGS

Pittsburgh	$23.00 to 24.00
Eastern Pennsylvania	21.00 to 22.00
Boston (dealers	15.00 to 15.50
St. Louis	15.00 to 15.50
Detroit	$18.00 to 19.00
Cleveland	19.50 to 20.00
Buffalo	19.50 to 20.50
Chicago	19.00 to 20.00

STEEL CAR AXLES

Pittsburgh	$45.00 to $46.00
Eastern Pennsylvania	40.00
Cleveland	37.00 to 38.00
St. Louis	34.00 to 34.50
Buffalo	39.00
Chicago	39.50 to 40.00
New York (dealers)	39.00 to 40.00
Birmingham	28.00 to 30.00
Boston (dealers)	30.00 to 31.00
Detroit	32.50

SHAFTING

Eastern Pennsylvania	$32.00 to 33.00
St. Louis	32.00 to 32.50
New York (dealers	28.00 to 29.00
Chicago	39.00 to 39.50
Boston (dealers)	30.00 to 31.00

Iron Foundry Scrap

CAR WHEELS

Pittsburgh, iron	$45.00 to 46.00
Pittsburgh, steel	30.50 to 31.50
Chicago, iron	39.00 to 40.00
Eastern Pennsylvania, iron	41.00 to 42.00
Cleveland, iron	35.00 to 36.50
St. Louis, iron	34.00 to 34.50
Buffalo, iron	40.00 to 41.00
Birmingham, iron	28.00 to 30.00
Birmingham, tram car	28.00 to 30.00
Boston (consumers)	35.00 to 36.00
Cincinnati	30.00 to 31.00
New York, iron	36.00 to 37.00
Detroit	30.00

NO. 1 CAST SCRAP

Pittsburgh, cupola	$41.00 to 42.00
Chicago, cupola	36.00 to 37.00
Eastern Pennsylvania, cupola	38.00 to 40.00
Cleveland, cupola	39.00 to 40.00
New York cupola (dealers)	36.00 to 37.00
Cincinnati, No. 1, machinery, cupola (net)	34.00 to 35.00
Detroit	34.00 to 35.00
Birmingham, cupola	32.00 to 34.00
St. Louis, railroad	33.50 to 34.00
St. Louis, agricultural	32.00 to 32.50
Buffalo	40.00 to 41.00
Boston (consumers)	39.00 to 42.00
Valleys	40.00 to 41.00

HEAVY CAST

New York (dealers)	$37.00 to 38.00
Buffalo	27.00 to 28.00
Pittsburgh	36.00 to 37.50
Cleveland	31.00 to 31.50
Boston (consumers)	35.00 to 37.00

MALLEABLE

Pittsburgh, railroad	$35.50 to 36.50
Pittsburgh, agricultural	33.50 to 34.00
Chicago, railroad	28.00 to 29.00
Chicago, agricultural	27.50 to 28.00
Eastern Pennsylvaina, railroad	28.00 to 29.00
Cleveland, railroad	32.75 to 33.25
Cleveland, agricultural	29.00 to 29.50
St. Louis, railroad	24.50 to 25.00
St. Louis, agricultural	24.00 to 24.50
Cincinnati, railroad	29.00 to 29.50
Cincinnati, agricultural	28.00 to 29.00
Boston, railroad	27.00 to 28.00
Buffalo	32.00 to 32.50
Detroit	28.00 to 29.00

Miscellaneous Scrap

REROLLING RAILS

5 feet and over

Pittsburgh district	$39.00 to 40.00
Chicago	36.00 to 37.00
Eastern Pennsylvania	38.00 to 39.00
Cleveland	38.00 to 39.00
St. Louis	34.00 to 34.50
Birmingham	30.00 to 32.00
Boston (dealers)	32.00 to 33.00

LOCOMOTIVE TIRES

Chicago	$25.00 to 25.50
St. Louis	20.00 to 20.50

BOILER PUNCHINGS

Chicago	$27.50 to 28.00
Eastern Pennsylvania	27.00 to 28.00

When the Scrap Market Is Dull

While seeking a more favorable market the best form in which to hold your sheet scrap, etc., and the form that always commands the best prices is the dense hydraulically compressed bundle.

Thus less storage space is required—under roof to prevent loss from corrosion; and because of greater car tonnage under minimum car rate, you add from 25% to 50% freight savings to your profits.

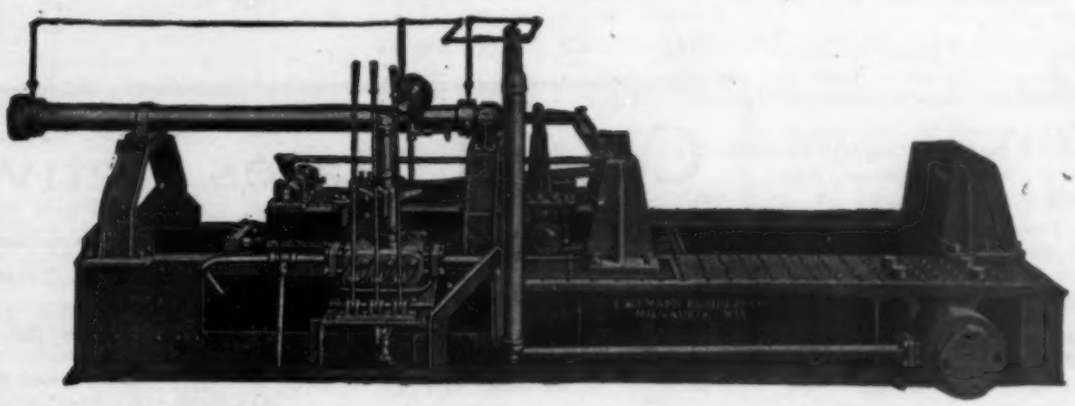
For greatest compression, largest daily output, at lowest operating cost, use

LOGEMANN Double Ram Hydraulic Scrap Metal PRESSES

You can enjoy the advantage of the accumulated experience from hundreds of Logemann scrap bundling presses now in use.

They embody a simplified mechanism that requires no special skill to operate rapidly. Press and pump are so designed that all the motive power applied is utilized, thus reducing power cost.

Powerfully built, all working parts constructed to resist the severest strains—selected material, first class workmanship—all minimize upkeep cost and insure lasting efficiency.



A medium sized press is shown; there are smaller and larger sizes in standard models.

Advise character and daily tonnage of your scrap and let us suggest press best suited to your requirements.

Logemann Brothers Co.

3126 Burleigh Street
Milwaukee, Wis.

Builders of Baling Presses and Hydraulic Machinery

(*Continued from page* 1026)

incorporated with a capital stock of $20,000, by C. M. Mugni, E. G. Dann and E. W. Froehlich, 515 Fifth street, Brooklyn.

NEW YORK.—The Automatic Ticket Register Corp. has been incorporated with a capital stock of $1,100,000, by S. and E. S. Bowman, and S. H. Grey, 178 Broadway, to manufacture registering devices, etc.

PINE PLAINS, N. Y.—The Stissing Light & Power Co. has been incorporated with a capital stock of $25,000, by Edward Bryan, W. Cole and F. E. Chase.

PLATTSBURG, N. Y.—The Plattsburg Body Corp. has been incorporated with a capital stock of $50,000, by J. B. Todd, P. A. and J. W. Gulbord.

SYRACUSE, N. Y.—The Air-Felt Shoe Polishing Machine Corp. recently was incorporated with a capital stock of $500,000, by J. C. Sanborn, A. E. and E. C. Enise.

WHITE PLAINS, N. Y.—The power house at the plant of Thompson Bros., Westmoreland avenue recently was damaged by fire.

BELLFONTE, PA.—The Nickel Fabricating Co. has been incorporated with a capital stock of $50,000, by Charles T. Hennig, Harry C. Taylor Brookline, Mass., and George H. Tray, Bellows Falls, Vt.

BRIDGEPORT, PA.—The Frank Richardson Boiler Works plans a new plant.

CHESTER, PA.—The Stallum Metals Corp. has been incorporated with a capital stock of $2,500,000, by S. S. Staley, J. J. Mullowney and Edward Stout, and plans are being prepared for a plant here.

CONNELLSVILLE, PA.—The Exacto Butter Machine Co. has been incorporated with a capital stock of $20,000, by A. R. Kidd, Frank Mantell and H. George May.

COUDERSPORT, PA.—The Graham Roller Bearing Corp. has been incorporated with a capital stock of $235,000, by Fletcher Goodwill, Jamestown, Pa. Fred C. Leonard John R. Collins and F. A. Raymond.

EASTON, PA.—The Commercial Metals Co. recently was incorporatd with a capital stock of $5000, by H. B. Bishop, Summitt, N. J., George W. Mullin and others.

FRANKFORT, PA.—The Fidelity Machine Co., 1629 Chestnut street, is reported planning a plant, two stories, 100 x 200 feet.

FRANKLIN, PA.—The Silica Products Co. recently was incorporated with a capital stock of 25,000, by J. M. Bowen, E. Lyon and Charles C. Bailey.

LANCASTER, PA.—The Gasco Mfg. Co., machinery, tools, etc., has been incorporated with a capital stock of $50,000, by R. W. Sehreiner, George H. Seireiner and L. R. Whallen.

McKEESPORT, PA.—The Columbiana Foundry Co has advised that the recent increase in its capita lstock was to care for the construction work and completion of its new plant here. The plant will be devoted to the manufacture of small machine molded gray iron, and it is being equipped with modern appliances.

PHILADELPHIA.—Small machine shop addition will be erected by the Vim Motor Truck Co.

PHILADELPHIA.—J. M. Kennedy Jr., 4068 South Van Pelt street, is reported planning a machine shop, one story, 20 x 120 feet.

PHILADELPHIA.—A small power house addition will be erected at the plant of Wm. Cramp & Sons Ship & Engine Co. The Fred A. Havens Co. has ben awarded the general contract.

PHLADELPHIA.—The Leiser Gast Stove Co. recently was incorporatel with a capital stock of $35,000, by William A. Leiser, L. S. Leiser and Walter K. Cook.

PHILADELPHIA.—M. L. Bayard & Co., Inc., has been incorporated with a capital stock of $500 by C. Q. MacDonough, 1230 Wakeling street, Frankford, Pa., and others, to manufacture machinery and parts.

In the South

ASHLAND, KY.—The Diamond Grid Battery & Electric Co. has been incorporated with a capital stock of $2500, by T. P. Owings, J. R. Briant and C. F. Higgins.

BLACKEY, KY.—The Dudley Coal Co. plans to construct a power house and other structures.

BLUEFIKL, KY.—The Utah Coal Co. plans the erection of a powerhouse and coal tipple.

DAVID, KY.—The Marion Coal Co. plans to construct a coal tipple, conveyor, power house, etc.

LOUISVILLE, KY.—The Ropke Automotive Corp. has been incorporated with a capital stock of $2000, by August Ropke, H. A. Ropke and Martin J. Pfeiffer.

WILLIAMSBURG, KY.—The Williamsburg Electric Co. has been incorporated by T. B. Mahan and others.

WILLIAMSBURG, KY.—Word has been received from the Williamsburg Electric Co., to the effect it is erecting a new power house, 30x 50 feet, and will install various electric equipment. The company is capitalized at $40,000.

MEMPHIS, TENN.—The James & Graham Wagon Co., 198 Jefferson avenue, will rebuild its plant recently damaged by fire.

CHARLOTTE, N. C.—The Southern Automatic Steam Carburetor Co. has been incorporated with a capital stock of $300,000.

CHARLOTTE, N. C.—The Cole Tractor Co. recently was incorporated with a capital stock of $125,000.

CHARLOTTE, N. C.—The Morrow Aircraft Corp has been organized by H. P. Morrow, William H. Clark W. F. Burton, and plans are being prepared for the erection of a building, 50 x 75 feet. The company is capitalized at $100,000.

EAGLES ISLAND, N. C.—The Hamme Marine Railway Co. will erect metal and woodworking shops, build 800-ton marine railway and make other improvements for the repairing of vessels.

ARLINGTON, GA.—The Baker County Power Co. is reported planning a hydro-electric plant to be built at a cost of $650,000. W. E. Saunders is secretary of the company.

ALBANY, GA.—The Consolidated Airplane Co. has been incorporated with a capital stock of $10,000, by J. F. Burke, B. D. Smith and others.

VALDOSTA, GA.—The Valdosta Retort Co. has been incorporated with a capital stock of $12,000, by D. A. Finley, R. L. Holliman and E. E. Quinker, to manufacture copper retorts.

BESSEMER, ALA.—The foundry at the plant of the National Steel Products Co.'s plant, recently was damaged by fire. The loss was estimated at $25,000.

BIRMINGHAM, ALA.—The American Enameled Products Co. has optioned a site but as yet has no plans for the erection of a plant.

MOBILE, ALA.—The Kelly Dry Dock & Shipbuilding Co. contemplates a power house, machine shop, etc., at a cost of $150,000.

ROGERSVILLE, ALA.—The Rogersville Light & Power Co. will erect a plant at a cost of $10,000.

GAINESVILLE, FLA.—This city plans to improve its light and water plant, by the erection of an addition, and the installation of some new equipment.

JACKSONVILLE, FLA.—Eli Ness, Savannah, Ga., has purchased a plant from the Shipping Board, and will continue to operate it, after improvements have been made.

MIAMI, FLA.—The Miami Supply Co., machinery, has been incorporated with a capital stock of $100,000, by F. Hynes, Charles Aulenbacser and L. B. Hynes.

ROCHELLE, FLA.—This city plans to improve its power plant and will install additional equipment.

VERO, FLA.—This city will extend its electric light plant and will install additional equipment.

Central States Activity

BELOIT, WIS.—George B. Slater and George E. Marsden of the Wisconsin Farm Implement Co., and others, have purchased the Badger State Machine Co., Janesville, Wis., and all machinery and equipment of the plant will be moved to this city and installed in the new owners' plant here.

KENOSHA, WIS.—Architects White & White have awarded contracts for a manufacturing plant, 45 x 175 feet, to be equipped for metal working. The name of the owner has been withheld.

WAUPACA, WIS.—Ralph Gertsch of Oshkosh, Wis., and several others, hae purchased the foundry operated by Fred Rosche. Repairs and additions will be made to the plant and it is expected it will be ready for operation about Nov. 1.

MENASHA, WIS.—Contracts have been awarded by the Wentink Mfg. Co. for the erection of a plant, 2-stories, 60 x 250 feet, to be built at a cost of $100,000.

MILWAUKEE.—The Wisconsin Bed Spring Co. contemplates a plant.

MILWAUKEE.—The C. H. & E. Mfg. Co., Inc., is erecting a plant addition, 50 x 140 feet, to be used for assembling purposes.

MILWAUKEE.—The American Spark Plug Co., which plans to transfer its plant from this city to Sun Prairie, Wis., has changed its name to the American Spark Plug & Porcelain Specialty Co.

MILWAUKEE.—The Milwaukee Boiler Co., 220 Oregon street, has reincorporated with a capital stock of $200,000, and it is reported the company plans to erect a new plant within the next year. William D. Johnson is president.

MILWAUKEE.—The Hess Mercury Carburetor Co. of Valparaiso, Ind., is reported planning to locate here. W. C. Hess, president, recently inspected several plant sites here and conffered with officials of th Milwaukee Association of Commerce.

MILWAUKEE.—The Rheitenbach Machinery Co. recently was incorporated with a capital stock of $100,000, by E. V. Breitenbach, George A. Hormui, L. C. Zeigler and E. G. Borisch.

MILWAUKEE.—Articles of incorporation have been filed by the Industrial Traffic Corp., with a capital stock of $200,000. The company will manu-

(*Concluded on page* 1034)

SIVYER S CASTINGS

Sivyer Steel tee connection used on Heine boilers

The Sivyer Service of providing Electric Steel Castings has for its objects the decrease of machining costs and the increase of wearing quality and life. Both are attained by methods which begin with the design of the casting itself and frequently result in design improvements.

Secondly: Sivyer Service analyzes the functions of the casting and specifies the proper composition steel for the job; long experience with carbon and alloy steels has enabled us to reduce costs and increase quality remarkably for many different industries.

Thirdly: Sivyer Service makes a thorough study of the pattern and molding problems involved, for improper gating and insufficient risers are often the greatest wasters of machining labor and metal.

Fourthly: Sivyer Service analyzes carefully the proper annealing methods to be used and precisely controls their application. In short, the Sivyer Service supervises every step necessary to secure unfailingly good castings of electric steel. From casting design to sand-blasting and tumbling, the fundamental superiority of Sivyer Steel is due to its men and metal. Their value is best proved by the fact that, although the production of steel castings is generally looked upon as a local one, the Sivyer market is national.

Where Strength is Vital

STRAINS imposed by steam pressures of from 200 to 350 lbs. per inch, and the maintenance of high factors of safety, demand for high pressure boiler construction metal parts positively sound and certain in strength. All fittings must be made of a close-grained metal absolutely free from flaws. Because Sivyer Electric Steel best satisfies such requirements the Heine Safety Boiler Co. is using Sivyer Castings for tee connections. Special gating, heading and pouring methods were devised by Sivyer to assure the perfection of these parts. This ability to meet exacting conditions has aided in winning for Sivyer Castings their nation-wide market.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Iron and Steel Prices

Iron Ore

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 per cent iron	$7.45
Mesabi Bessemer, 55 per cent iron	7.20
Old range nonbessemer, 51½ per cent iron	6.70
Mesabi nonbessemer, 51½ per cent iron	6.55

Port Henry Iron Ore, f.o.b. Port Henry

Old bed 21 furnace	$5.80
Old bed concentrates, 63 per cent	6.70
Harmony, cobbed, 63 per cent	6.70
New bed, low phos., 65 per cent	9.50
Lump ore for fix	7.00

Manganese Ore

Brazilian, 48 to 50 per cent, c.i.f. Atlantic ports, 70 to 75 cents per unit.

Indian 48 to 50 per cent. c.i.f. Atlantic ports, 70 to 75 cents per unit.

Caucasian, 48 to 50 per cent, f.o.b. cars, Atlantic ports, 70 to 75 cents per unit.

FLUOR SPAR

Washed gravel Kentucky and Illinois mines, per ton ..... $22.00 to 25.00

Warehouse Prices

Steel bars, Boston	5.50c to 6.00c
Steel bars, Chicago	3.48c to 3.98c
Steel bars, Cleveland	3.34c to 4.00c
Steel bars, Detroit	4.485c
Steel bars, Philadelphia	5.00c
Steel bars, Phila., ½ inch and smaller	6.00c
Steel bars, New York	3.48c to 4.75c
Steel bars, St. Louis	3.57½c to 4.04½c
Steel bars, Cincinnati	5.00c to 6.00c
Steel bars, St. Paul	3.76c to 4.50c
Steel bars, Buffalo	4.65c
Iron bars, Boston	6.00c
Iron bars, Buffalo	5.26c
Iron bars, Chicago	3.98c to 4.61c
Iron bars, Detroit	4.485c
Iron bars, St. Louis	4.60c
Iron bars, Cincinnati	4.50c
Iron bars, Philadelphia	5.00c
Iron bars, New York	5.25c
Shapes, Chicago	3.58c to 4.08c
Shapes, Detroit	4.42c
Shapes, Boston	5.50c to 6.00c
Shapes, St. Louis	3.67½c to 4.17½c
Shapes, St. Paul	3.85c to 4.385c
Shapes, New York	4.30c
Shapes, Cleveland	3.44c
Shapes, Philadelphia	4.75c
Shapes, Phila., smaller than 3 inch	5.00c
Shapes, Buffalo	4.50c
Shapes, Cincinnati	4.50c
Plates, Buffalo	4.70c
Plates, Chicago	3.78c to 4.28c
Plates, Detroit	4.87c
Plates, Boston	6.50c
Plates, St. Louis	3.875c to 4.375c
Plates, St. Paul	4.00c to 4.865c
Plates, New York	4.50c
Plates, Cleveland	3.64c
Plates, Phila., ¼-inch and heavier	5.50c
Plates, Phila., ⅜-inch	6.00c
Plates, Cincinnati	6.00c
No. 10 blue anl. sheets, N. Y.	7.23c to 9.00c
No. 10 blue anl. sheets, Phila.	8.00c
No. 10 blue anl. sheets, Chicago	4.68c to 7.13c
No. 10 blue anl. sheets, Cleveland	6.75c
No. 10 blue anl. sheets, Boston	9.00c
No. 10 blue anl. sheets, Buffalo	7.15c
No. 10 blue anl. sheets, Detroit	6.95c
No. 10 blue anl. sheets, St. L.	7.22½c
No. 10 blue anl. sheets, Cincinnati	7.50c
No. 10 blue anl. sheets, St. Paul	7.25c
No. 28 black sheets, Chicago	5.73c to 8.11c
No. 28 black sheets, New York	8.60c
No. 28 black sheets, Phila.	9.25c
No. 28 black sheets, Cleveland	6.75c to 8.50c
No. 28 black sheets, Boston	9.70c to 9.90c
No. 28 black sheets, Cincinnati	9.00c
No. 28 black sheets, Detroit	8.00c
No. 28 black sheets, St. Louis	8.20c
No. 28 black sheets, St. Paul	6.00c to 8.39c
No. 28 black sheets, Buffalo	9.10c
No. 28 galv. sheets, Chicago	9.61c
No 28 galv. sheets, New York	9.85c
No. 28 galv. sheets, Phila.	11.00c
No. 28 galv. sheets, Boston	11.00c to 11.50c
No. 28 galv. sheets, Cleveland	9.00c to 9.50c
No. 28 galv. sheets, Cincinnati	9.00c
No. 28 galv. sheets, Detroit	10.00c
No. 28 galv. sheets, Buffalo	10.60c
No. 28 galv. sheets, St. Louis	9.70c to 10.35c
Bands, New York	6.43c to 7.11c
Bands, Boston	8.00c
Bands, Detroit	5.785c
Bands, Buffalo	6.35c
Hoops, Buffalo	6.60c
Hoops, Boston	9.00c
Hoops, New York	6.68c to 7.61c
Hoops, Detroit	6.535c
Cold rolled shafting, Buffalo	6.00c
Cold Rolled Shafting, New York	6.36c to 8.11c
Cold rolled shafting, Boston	10.00c
Cold rolled flats, squares and hexagons, New York	6.86c to 8.61c
Cold rolled rounds	6.36c to 8.11c
Cold rolled rounds, Detroit	5.70c

Mill Sheet Schedule

Black

Differentials for gage, per 100 pounds

No. 30	+20c
No. 29	+10c
No. 28 (carloads)	Base
No. 27	—05c
Nos. 25-26	—10c
Nos. 22-24	—15c
Nos. 17-21	—20c
Nos. 15-16	—25c
Nos. 13-14	—30c
Nos. 10-12	—35c

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28 and 30 inches wide by 72, 84, 96 and 120 inches long. Gages Nos. 14 to 28 in addition to the foregoing, 36 wide by 96 inches and 120 inches long. Extras for width and length to be added.

Freight Rates

Effective Aug. 26 but subject to revision by official tariffs

PIG IRON

Mahoning and Shenango valleys to:	
Cleveland	$1.96
Newark, N. J.	6.72
Boston	7.38
Philadelphia	6.32
Pittsburgh	1.96
St. Louis	6.44
Minneapolis, St. Paul	7.80
Buffalo to:	
Albany, N. Y.	$3.52
New England (rail)	5.46
New York and Brooklyn (rail)	5.46
Virginia furnaces to:	
Philadelphia	$5.74
New England	6.26½
Brooklyn, Jersey City, Newark	6.16
Birmingham, Ala., to:	
Boston	$10.665
Cincinnati	4.50
Chicago	6.66
Cleveland	6.66
Louisville, Ky.	4.12
Minneapolis, St. Paul	9.73
New York	10.26
Philadelphia	5.665
Pittsburgh	7.00
Savannah, Ga.	4.25
St. Louis	5.375
Chicago to:	
Des Moines	$4.725
Minneapolis, St. Paul	3.375
Milwaukee	.89
Moline, Ill.	1.89
Omaha	6.07
St. Louis	2.725
Ironton and Jackson, O., to:	
Chicago	$5.32
Cincinnati	2.52
Cleveland	3.36
Detroit	3.64
Indianapolis	3.22
Minneapolis, St. Paul	8.40

FINISHED MATERIAL

Pittsburgh, carloads, per 100 lbs., to:

New York	38.0 cents
Philadelphia	35.0 cents
Boston	41.5 cents
Buffalo	29.5 cents
Baltimore	33.5 cents
Cleveland	24.0 cents
Cincinnati	22.0 cents
Chicago	38.0 cents
Detroit	32.0 cents
Minneapolis and St. Paul	66.0 cents
Denver	$1.32
St. Louis	47½ cents
New Orleans	51.5 cents
Birmingham	76.5 cents
Pacific coast (all rail)	$1.665
Pacific coast (tin plate)	1.665

GALVANIZED AND LONG TERNE

No. 30	+50c
No. 29	+25c
No. 28 (carloads)	Base
No. 27	+15c
Nos. 25-26	—30c
Nos. 22-24	—45c
Nos. 17-21	—60c
Nos. 15-16	—75c
Nos. 12-14	—90c
Nos. 10-11	—1.00

Standard Sizes

Gages Nos. 12 to 30 inc., 24, 26, 28, 30 and 36 in. wide by 72, 84, 96 and 120 in. long. Extras for width and length to be added.

BLUE ANNEALED

Differential for gage for 100 pounds

Nos. 8 and heavier	— 5c
Nos. 9 and 10 (carloads)	Base
Nos. 11 and 12	+ 5c
Nos. 13 and 14	+10c
Nos. 15 and 16	+20c

Standard Sizes

Widths—24-26-28-30-36 and 48 inches.
Lengths—72-84-96-120 and 144 inches.
Extras for width and length to be added.

Tubular Goods

Pittsburgh basing discounts to jobbers in carloads.

Steel Pipe

STANDARD WEIGHT

Butt Weld

	Black	Galvanized
⅛, ¼ and ⅜-inch	47 to 50½	20½ to 24
½-inch	51 to 54½	36½ to 40
⅝ to 3-inch	54 to 57½	40½ to 44
Lap Weld		
2-inch	47 to 50½	34½ to 38
2½ to 6-inch	50 to 53½	37½ to 41
7 to 12-inch	47 to 50½	33½ to 37
13 to 14-inch	37½ to 41	
15-inch	35 to 38½	

PLUGGED AND REAMED

Butt Weld		
1 to 3-inch	52 to 55½	38½ to 42
Lap Weld		
2-inch	45 to 48½	32½ to 36
2½ to 6-inch	48 to 51½	35½ to 39

EXTRA STRONG PLAIN ENDS

Butt Weld		
⅛, ¼ and ⅜-inch	43 to 46½	25½ to 29
½-inch	48 to 51½	35½ to 39
¾ to 1½-inch	52 to 55½	39½ to 43
2 to 3-inch	53 to 56½	40½ to 44
Lap Weld		
2-inch	45 to 48½	33½ to 37
2½ to 4-inch	48 to 51½	36½ to 40
4½ to 6-inch	47 to 50½	35½ to 39
7 to 8-inch	43 to 46½	29½ to 33
9 to 12-inch	38 to 41½	24½ to 28

DOUBLE EXTRA STRONG PLAIN

	Butt Weld	
½-inch	39 to 42½	28½ to 32
¾ to 1½-inch	42 to 45½	31½ to 35
2 to 2½-inch	44 to 47½	33½ to 37
Lap Weld		
2-inch	37 to 40½	27½ to 31
2½ to 4-inch	39 to 42½	28½ to 33
4½ to 6-inch	38 to 41½	28½ to 32
7 to 8-inch	33 to 36½	19½ to 23

Wrought Iron Pipe

Pittsburgh basing discounts to jobbers in carloads

THREADS AND COUPLINGS

	Butt Weld	
¼-inch	+	38
⅜-inch	15½ to 25½	+ 1½ to 11½
½-inch	19½ to 29½	1½ to 11½
¾ to 1½-inch	24½ to 34½	8 to 18½
Lap Weld		
2-inch	20½ to 28½	6½ to 14½
2½ to 6-inch	22½ to 30½	9½ to 17½
7 to 12-inch	19½ to 27½	6½ to 14½

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG PLAIN ENDS

	Butt Weld	Black	Galvanized
¼-inch	+	9	+ 35
⅜-inch	13½ to 23½		6½ to +3½
½-inch	18½ to 28½		5½ to 15½
¾ to 1½-inch	24½ to 34½		9½ to 19½
Lap Weld			
2-inch	21½ to 29½		8½ to 16½
2½ to 4-inch	23½ to 31½		11½ to 19½
4½ to 6-inch	22½ to 30½		10½ to 18½
7 and 8-inch	14½ to 22½		2½ to 10½
9 and 12-inch	8½ to 17½		5½ to +2½

DOUBLE EXTRA STRONG, PLAIN ENDS

	Butt Weld	Black	Galv.
½-inch	15½ to +39½		3½ to +51½
¾-inch	20½ to +22½		8½ to +34½
1-inch	+38½		+30½
1¼-inch	+22½		+34½
1½-inch	+21½		+33½
Lap Weld			
2-inch	16½ to + 7½		4½ to +10½
2½ to 4-inch	18½ to + 2½		9½ to +11½

Clean Water Means Greater Boiler Efficiency

STATIONARY water screens which become clogged with trash, leaves and debris of various kinds results in a dangerously low water supply to boilers, often making a complete shut-down of the entire plant necessary while clearing the intake.

Link-Belt Traveling Water Screens are self-cleaning. They require little attention and insure a steady supply of clean water to boilers at all times. There are no expensive shut-downs, no extra cleaning costs, and no dangers to power plant equipment due to trashy water.

We show a Link-Belt installation at the power plant of a large Ohio steel company. Send for a copy of our Water Screen Book No. 352.

LINK-BELT COMPANY 263

PHILADELPHIA		CHICAGO		INDIANAPOLIS	
New York	299 Broadway	Kansas City, Mo.		908 Elmhurst Bldg.	
Boston	49 Federal St.	Seattle		576 First Ave. S.	
Pittsburgh	1501 Park Bldg.	Portland, Ore.		First and Stark Sts.	
St. Louis	Cent'l Nat'l Bank Bldg.	San Francisco		695 Market St.	
Buffalo	547 Ellicott Square	Los Angeles		163 N. Los Angeles St.	
Wilkes-Barre, Pa.	National Bank Bldg.	Toronto, Can.		Canadian Link-Belt Co., Ltd.	
Cleveland	Kirby Bldg.	Denver, Colo.	Lindroth, Shubart & Co.,	Boston Bldg.	
Detroit	790 Woodward Ave.	Louisville, Ky.		Frederick Wehle, Starks Bldg.	
New Orleans	C. O. Hinz, Hibernia Bank Bld.				

LINK-BELT

Traveling Water Screens

We Also Make

- ☐ Elevators and Conveyors
- ☐ Chains and Sprockets
- ☐ Silent Chain Drives
- ☐ Truck and Tractor Chains
- ☐ Electric Hoists
- ☐ Locomotive Cranes
- ☐ Portable Loaders
- ☐ Coal and Ashes Systems
- ☐ Coal Pockets

Write for Catalogs
Place X in Square

Say you saw it in THE IRON TRADE REVIEW

(*Concluded from page* 1030)

facture and deal in machinery and devices for loading and unloading cars, conveyors for docks, etc. The incorporators are M. B. Fox, H. M. Fox and Arthur Barry, Security building, Milwaukee.

OCONOMOWOC, WIS.—The Erni Laundry Machinery Co. is erecting an addition to its plant, 1 story, 40 x 60 feet.

RACINE, WIS.—The Thor Machine Works has starte doperations in its new plant, 78 x 170 feet at Fifteenth and Clark streets.

RACINE, WIS.—Articles of incorporation have been filed by the Steel Products Co., with a capital stock of $30,000. The incorporators are William H. Cahill, Lewis J. Quinn and A. L. Strike. The company will manufacture automotive parts and accessories.

SHEBOYGAN FALLS, WIS.—The White Wagon Works has increased its capital stock from $75,000 to $125,000, and the erection of an addition to its plant is being completed.

ALMA, MICH.—The Truck Parts & Foundry Co. has been organized and has taken over the plant of the Western Carburetor Co. The company is capitalized at $12,000. Incorporators are H. H. Soule, Charles O. Ward and Harley Williams.

RED WING, MINN.—Roland Cowles and Grant Norton are remodeling a building to be used as a machine shop.

BENTON HARBOR, MICH.—The Traction Foundry & Machine Co. has been organized with a capital stock of $80,000, by S. E. Doster and others.

DETROIT.—The E. F. Lyon Co., 14 Antoinette avenue, is reported planning an addition to its plant, one story, 96 x 125 feet, to cost $15,000.

DETROIT.—The Reliance Elevator Co., Chicago, has purchased the site of the Palmer Tire & Rubber Co. at St. Joseph, Mich., and plans to modernize the factory buildings for its own use.

KALAMAZOO, MICH.—The Kalamazoo Sedan Co. has been incorporated with a capital stock of $150,000, and has purchased the plant of the American Carriage Co. Officers are President, G. C. Bobb; vice president, George E. Steers and secretary and treasurer, M. S. Arnold.

BELLEVILLE, ILL.—Articles of incorporation have been filed by the Supreme Foundry Co. with a capital stock of $20,000. The incorporators are N. L. Gunsman, E. L. Stonewater and Otto Zottman. The company will manufacture castings and stoves.

CHICAGO.—The Delta Star Electric Co. plans an addition to its plant, 1-story, 67 x 91 feet, to cost about $19,000.

CHICAGO.—The Groen Mfg. Co., Inc., 4531 Armitage avenue, coppersmith, has advised that it has purchased its present location, and has deferred until a later date its plans for the erection of a new plant, which it had been contemplating.

CHICAGO.—Plans are being prepared for the erection of a plant for the Kroeschell Bros. Co. and the Kroeschell Bros. Ice Machine Co., which will be built at a cost of $750,000. A site, 300 x 600 fet, has been purchased.

CHICAGO.—The plant of the Material Construction Co., Ninety-second street, recently was damaged by fire. The loss was estimated at $200,000. It was built during the war by the government for use as a machine shop, and in 1919 was sold to the present owner.

CHICAGO.—The Hamler Boiler & Tank Co., has purchased 5½ acres on West Sixty-first street, on which it will erect a plant, the first unit of which will be 1-story, and contain about 40,000 square feet of floor space. Other structures to be erected will house a machine shop, flange shop and administration offices.

DECATUR, ILL.—The U. S. Wire Mat Co., 260 East Wood street, is reported planning a plant, two stories, 60 x 150 feet.

ROBINSON, ILL.—The machine shop of the Fig's Garage recently was damaged by fire. The shop was well equipped with lathes, drill presses, etc., all of which were badly damaged.

STERLING, ILL.—The Eclipse Lawn Mower Co. is erecting a foundry, 106 x 125 feet.

GOSHEN, IND.—The Advanced Castings Co. has been incorporated with a capital stock of $40,000, by E. Schacht, F. W. Bemm and others.

LA PORTE, IND.—The Advance-Rumely Co. is reported planning to build a large foundry at Clearing, Ill., where it is maintaining a temporary office with the Standard Steel Casting Co.

Business Changes Announced Recently by the Trade

THE Lancaster Steel Products Corp., Lancaster, Pa., recently opened a New York office in the National Association building, at 25 West Forty-third street. The office is in charge of L. E. Vesey, as district sales manager. Mr. Vesey comes to New York from the Chicago office, where he has been engaged for the past year and a half. This office, together with the Hartford, Conn., Detroit and Chicago offices, will enable the Lancaster Steel corporation more adequately to take care of its rapidly growing business in the cold rolled and cold drawn steel field.

C. M. Weld, consulting mining engineer, has removed his offices to 2 Rector street, New York.

* * *

The General Machinery & Supply Co., of Philadelphia, has filed notice of change of its name to the General Grinding Wheel Corp.

* * *

A. Balkenende & Bros., Jersey City, N. J., manufacturers of ash cans, washboilers, sifters, stove pipes, etc., have removed their headquarters to 143 Beacon avenue.

* * *

The Machine & Stamping Co. Ltd., 1209 King street, west, Toronto, Ont., changed its name on Oct. 1 to the Russell Gear & Machine Co. Ltd., without changing the management.

* * *

Ackerman Bros. Co. Inc., 95 Liberty street, New York, machinery hardware, tools and supplies, has removed its office from that address to the store, located at 301 West Fourth street, in order to centralize its business.

On Oct. 1 Cyril J. Bath & Co., Cleveland, dealers in new and used machines, removed their display rooms and offices to 1603 St. Clair avenue, Cleveland, where a representative stock of new and used tools will be carried. The used machinery warehouse and plant for rebuilding machinery will be maintained as heretofore at 1738 St. Clair avenue.

* * *

The Anacortes Iron Works, Anacortes, Wash., will remove from its present location 1011 Second street to Third and O streets. The new shop will be one of the most complete in this section of the state. The company will continue to do a general line of forge work and in addition, will specialize in cannery coolers and fish trap staples.

* * *

The Easthampton Foundry Co., Easthampton, Mass., has sold its property to the George S. Colton Elastic Web Co., of that city, and will move to Florence, Mass., this fall, occupying the plant of the Northampton Iron Works, which has moved into the foundry of the old Florence Sewing Machine Co. Ernest A. Moeckel has been proprietor of the Easthampton Foundry Co. for 22 years.

* * *

The Norton Co., Worcester, Mass., has established a branch office for its grinding machine division in Indianapolis, 304 Penway building, under the direction of Walter F. Rogers, district representative. This will in no way effect the distribution of the company's grinding wheels. They will be handled by the Vonnegut Hardware Co., Indianapolis, as in the past. Another branch has been established in Pittsburgh, at room 800, 230 Fifth avenue, in charge of Paul R. Hawkins, district manager. In Pittsburgh, the grinding wheels will continue to be distributed by Somers, Filter & Todd Co., 327 Water street, Pittsburgh.